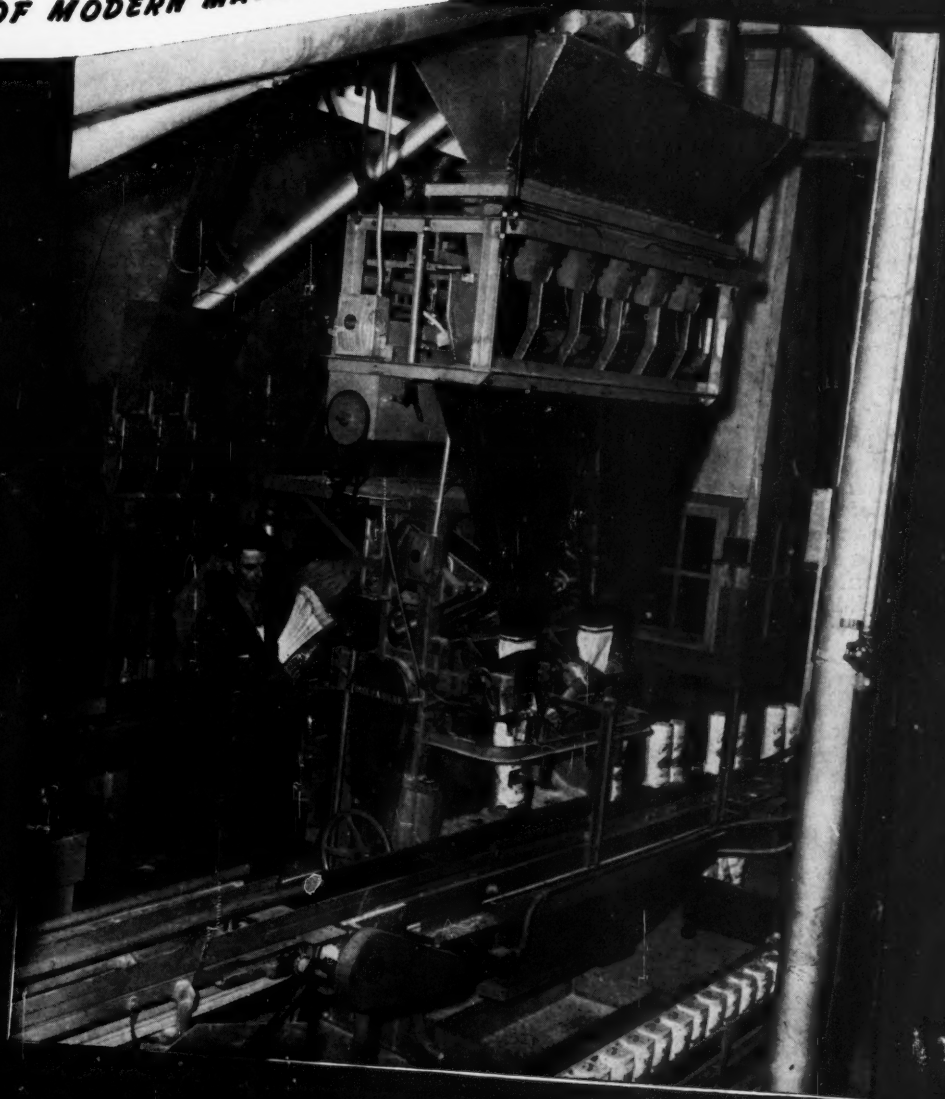
Flow

THE MAGAZINE OF MODERN MATERIAL HANDLING AND PACKAGING METHODS



CIRCULATION THIS ISSUE – 29,235

Safe, Swift Handling Pays Dividends!

● Yes, with finger-tip precision, one man masters ponderous loads — lifting, lowering, transporting, stacking — from any point to any other in the area served by a Trav-Lift Crane. *And all without rehandling.* With P&H variable speed push-button control you have the power, speed and versatility that pays real profits in time and money saved.

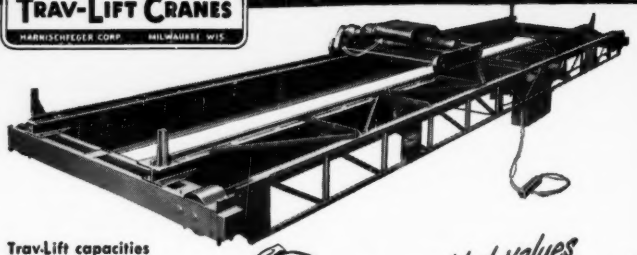
Rugged design, rigid welded construction and especially designed electrical equipment assures you of safe, dependable service for many years to come. Built by America's leading producer of overhead materials handling equipment.

Where your service requirements do not warrant investment in a heavy duty crane, the P&H Trav-Lift is the answer. Ask us to send Bulletin H-13-1.

P&H

TRAV-LIFT CRANES

HARNISCHFEGER CORP. MILWAUKEE WIS.



Trav-Lift capacities run up to 15 tons.

These added values protect your investment

VARIABLE SPEED FULL MAGNETIC CONTROL provides 5 distinct steps for all motions; controlled from pendant push-button or from operator's cab.

SAFE — Only 110 volts at the push-button when floor-controlled. Start-stop main line contactor, disconnect switch, thermal overload protection, magnetic limit switch and powerful brakes assure maximum safety.

ALL-WELDED BRIDGE AND TROLLEY incorporates the most important factors in reliable service — rigidity, safety, accessibility.

LIFE-TIME CONSTRUCTION — Motors designed specifically for crane service — high starting torque, frequent reversal, etc. Shaved gears, grease sealed anti-friction bearings throughout.

COMPETENT ENGINEERING SERVICE — P&H materials handling engineers will gladly bring their years of experience to bear on your particular problems. Write us.

Handle it "thru-the-air" at lower cost

P&H

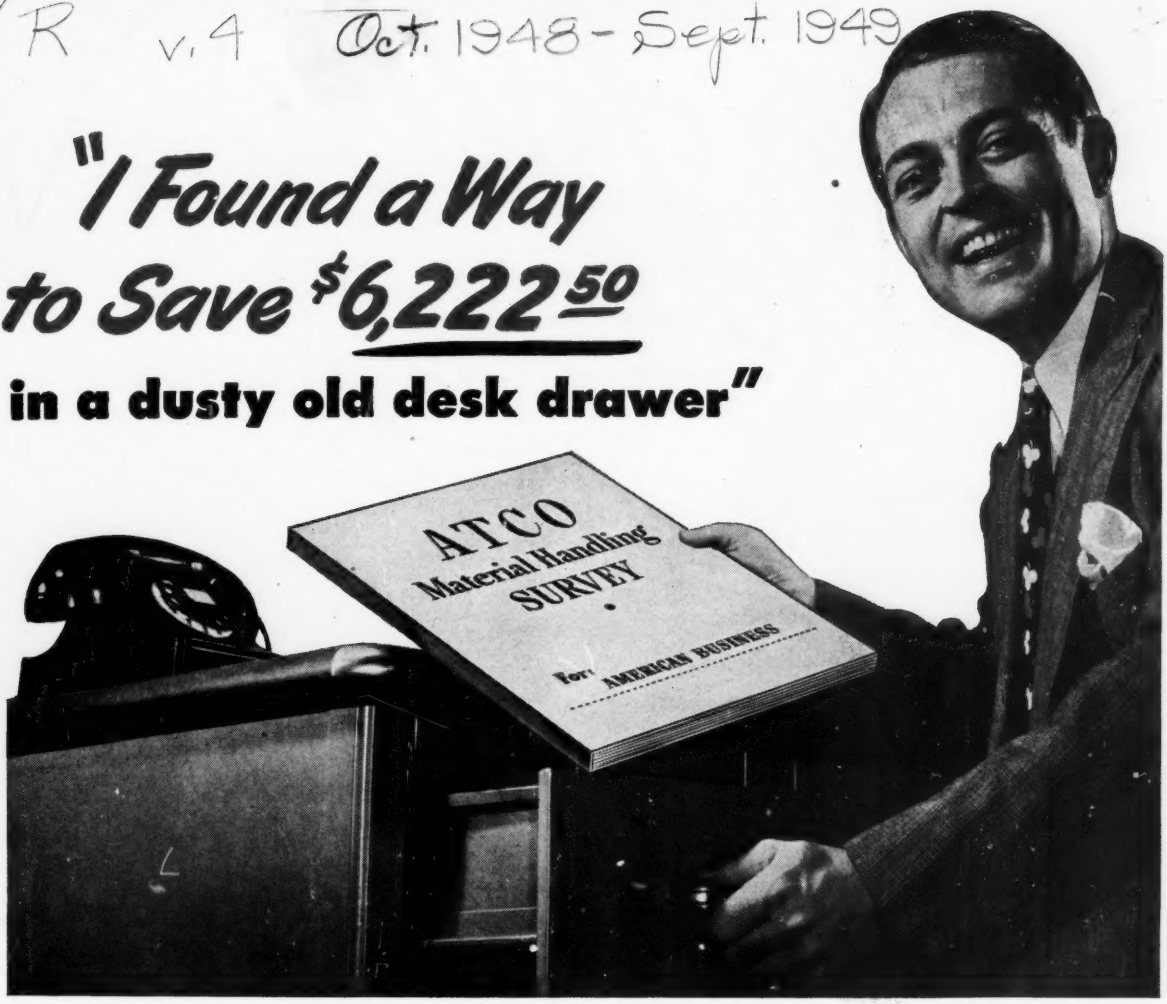
ELECTRIC HOISTS

HARNISCHFEGER CORPORATION

ELECTRIC CRANES · EXCAVATORS · ARC WELDERS · P&H · HOISTS · WELDING ELECTRODES · MOTORS

R v.4 Oct. 1948 - Sept. 1949

"I Found a Way to Save $6,222.50 in a dusty old desk drawer"



● "I happened to be rummaging through an old desk about to be discarded for a newer model. In one of the drawers, gathering dust, I came upon a booklet labeled 'ATCO Material Handling Survey'.

"Upon closer inspection, I found it to be a complete and thorough study showing how we could save $6,222.50 in just one phase of our radio cabinet unloading operation. It seemed fantastic . . . perhaps that's the reason it remained unacted upon. But $6,222.50 is a lot of money to save. So I called in the ATCO Material Handling Specialist who made the survey.

"His time studies and cost figures told a truly amazing story of human energy saved, handling costs slashed unbelievably in the unloading of hundreds and hundreds of carloads of our difficult-to-handle radio cabinets.

"On the basis of his survey, we ordered 2 Automatic Skylift Electric Trucks, and 3 Transporter Motorized Hand Trucks. Skylift not only moved huge loads of radio cabinets from low-doorway freight cars, but also stacked them ceiling-high in storage. Then Transporter midgets of electric power moved the cabinets to production and the finished radios from the end of production line to shipping.

"Where formerly it took 25 man-hours to unload 1 carload of radio cabinets at a labor cost of $32.75 per car, it now takes only . . . 6 man-hours to unload the same car . . . a saving of 19 man-hours or $24.89 labor cost saved per car.

"Multiply this by the hundreds of carloads on our unloading schedule, and it adds up to a $6,222.50 SAVED . . . a return of 75% on our investment . . . and on just one phase of our radio manufacture operation.

"An ATCO Specialist may be able to do for *your business* what he did for *mine*. At least let him make a survey. It costs you nothing. Mail the coupon."

Skylift
ELECTRIC TRUCKS
A PRODUCT OF AUTOMATIC
Lighten LIFE'S LOADS

AUTOMATIC TRANSPORTATION COMPANY
DIV. OF THE YALE & TOWNE MFG. CO.
141 West 87th Street, Dept T-8, Chicago 20, Ill.

Please mail me, without cost or obligation, complete facts about AUTOMATIC SKYLIFTS and TRANSPORTERS, the miracle electric trucks and how they can cut my handling costs.

( ) Have an ATCO Material Handling Specialist make a FREE survey of our handling costs.

Company Name.....

By.....Position.....

Street Address.....

City.....State.....

Only GOULD Has It!

A modern research laboratory with pilot manufacturing plant where advance-design batteries are constantly created—and proved before production.

Gould's Pilot Plant is a complete experimental-scale manufacturing plant in which advance-design batteries are pre-tested and proved before commercial release.

The Pilot Plant is where all Gould developments prove their commercial worth. Each advance of research must prove itself . . . must prove to be practical. Here, Gould has already made advances in methods of die-casting and in the use of powdered metals, and has done revolutionary work in the improvement of gravity casting. Here, present batteries are being perfected and tomorrow's advance-designs are being created. Another reason why the better batteries come from GOULD—FOR FIFTY YEARS THE CHOICE OF ENGINEERS.

The Gould "Thirty"—America's Finest Industrial Truck Battery!

GOULD

STORAGE BATTERY CORPORATION

Including the Storage Battery Division of Philco Corporation

TRENTON 7, NEW JERSEY

Always Use Gould Automobile and Truck Batteries

OCTOBER, 1948
VOLUME 4, No. 1

Flow

COVER PHOTO—This machine fills rice into non-rigid bags, which are then baled. One of the pioneers of this fairly recent development is the United Rice Milling Products Co., Inc., New Orleans, La. This high speed filling operation has enabled the company to satisfy the consumer demand for a large-size, economical package.

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FLOW is indexed regularly by Engineering Index, Inc.

For CARLOAD AND TRUCK Shipments

Use BRAINARD STRAPPING SYSTEM

If you are crating, skidding or packaging your product for car or truck shipment and are looking for ways to speed and simplify this operation, it would pay you to become acquainted with the Brainard Strapping System.

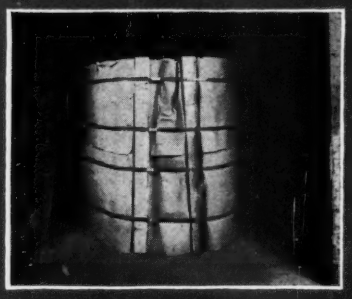
There are hundreds of instances where Brainard experts have saved manufacturers 40 to 60% of costs in the shipping room. And Brainard's complete control of the material —from basic ore to finished product—assures you of the highest quality at the lowest possible cost.

Pictured are just a few of the many ways Brainard is helping manufacturers ship safer, quicker, at a lower cost per unit.

Our engineers welcome the opportunity to study your shipping problems and recommend the most efficient method of strapping your shipments. No obligation. Write today.

BRAINARD STEEL COMPANY • • • WARREN • OHIO

STEEL STRIP



ROOFING

LOADING STEEL DRUMS

SHARONSTEEL

STEEL HIGHWAY POSTS

LARGE STEEL TANKS

How continuously it works is what counts

Illustrated here is a handling operation which is typical of the work some trucks perform throughout every shift . . . 24 hours a day! Under such circumstances every delay for servicing or repairs means lost time, lost income.

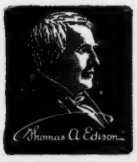
★

The logical truck for such work is an electric truck. Its motor drive stays on the job because it has few wearing parts . . . *only one basic moving part.*

The logical battery to power the truck is an EDISON Nickel-Iron-Alkaline Battery. With steel cell construction inside and out, an electrolyte that is a preservative of steel, and a foolproof electrochemical principle of action, EDISON Batteries are the longest-lived, most durable and most trouble-free of all.

★

For long years of dependable service, equip your trucks with EDISON Batteries. *They're built stronger and last longer!*



EDISON

Nickel • Iron • Alkaline

STORAGE BATTERIES

ADVANTAGES OF EDISON NICKEL-IRON-ALKALINE BATTERIES:

They are durable mechanically; can be charged rapidly; withstand temperature extremes; are foolproof electrically; can stand idle indefinitely without injury; are simple and easy to maintain.

EDISON STORAGE BATTERY DIVISION OF THOMAS A. EDISON, INCORPORATED, WEST ORANGE, N. J.

In Canada: International Equipment Company, Ltd., Montreal and Toronto

Pittsburgh Cargotainers save $35. per carload handling castings at Westinghouse

OLD METHOD

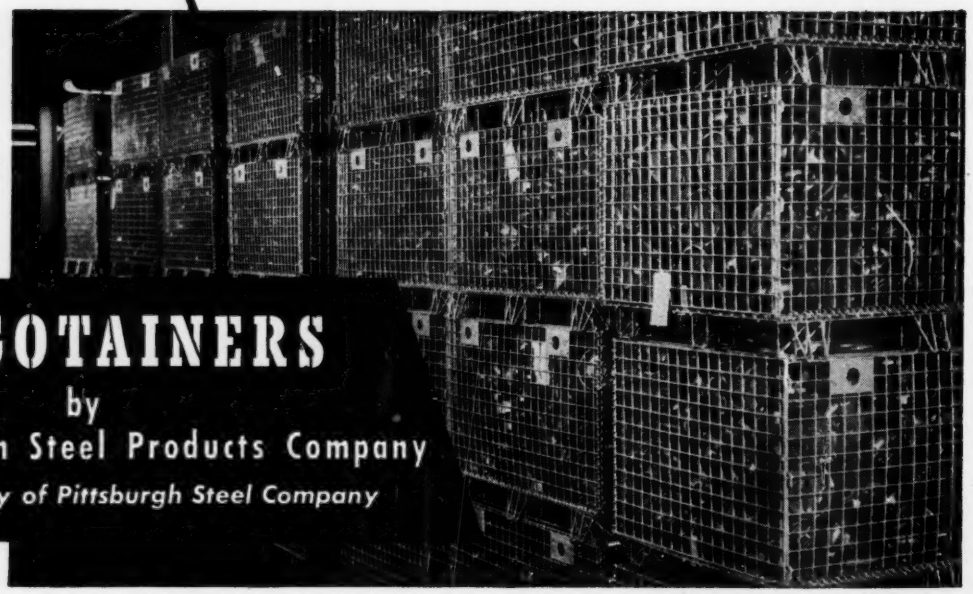
You can save with Cargotainers just as Westinghouse is doing at its Small Motors Division, Lima, Ohio. Formerly, bracket castings were unloaded by hand from railroad freight cars into skidboxes. These were carried to the storeroom by electric truck and unloaded by hand into wooden bins. This took one man 48 hours—it cost $41.00.*

Now the castings are received in collapsible wire Cargotainers. The same electric truck picks up the containers of castings from the freight car and unloads it in only 3½ hours at a cost of merely $6.00—a net savings of $35 per carload. In addition Pittsburgh Cargotainers have made possible several other savings—the old wooden bins are out and castings are now kept in Cargotainers tiered four-high until used—a big savings in floor space. Breakage in the Westinghouse plant has been eliminated as has the demurrage on freight cars. Better inventory and accounting is possible. Work is scheduled without delay. These are all extra savings not included in the $35 saved on handling alone.

If you want to save money on your materials handling, it will pay you to investigate Pittsburgh Cargotainers. Write to Pittsburgh Steel Products Company, 3255 Grant Building, Pittsburgh 30, Pa. for information.

**From "Better Handling Nets Important Savings" Factory Management & Maintenance, February 1948.*

MODERN CARGOTAINER METHOD



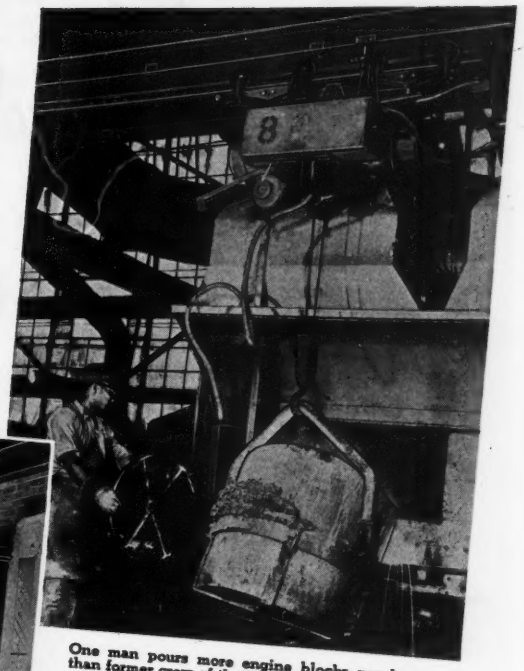
CARGOTAINERS

by

Pittsburgh Steel Products Company

Subsidiary of Pittsburgh Steel Company

HEAVY LOADS GO "*Up and Over*" with finger tip control

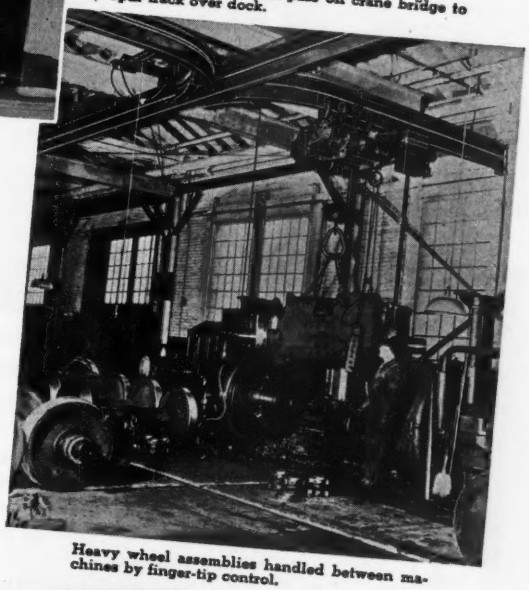


One man pours more engine blocks per hour than former crew of three.

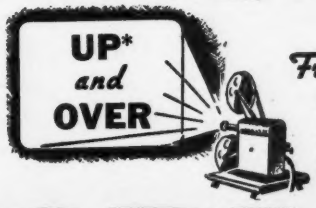
Two ton loads of steel pass off crane bridge to spur track over dock.

American MonoTractors do the hard jobs the easy way. They perform automatic "Up and Over"* handling operations with extreme accuracy and reliability. Finger-tip control assures accurate movement and spotting of the load. "Up and Over" machinery and equipment means no damage to machines or materials and no congestion in the operating area. More important, they eliminate back-breaking labor. The hazard of bad strains and hernia is gone.

In short, American MonoRail Overhead Handling Equipment increases production, saves labor, saves time and cuts costs. American MonoRail engineers will gladly show you that automatic handling pays and saves.



Heavy wheel assemblies handled between machines by finger-tip control.



Free MOVIE

A twenty-minute 16 mm. sound film gladly loaned upon request.

THE AMERICAN MONORAIL COMPANY

13129 ATHENS AVENUE — CLEVELAND 7, OHIO

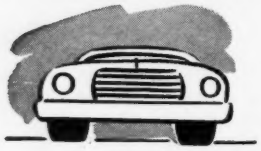
Only GENERAL gives you a complete line of *Wide Base Industrial Pneumatics* for Heavy Hauling

The Great Bell Prime Mover Moves 1000 lbs. Easily, Safely on General Industrial Pneumatics

***Standard* for all Army Air Corps Ground Equipment**

General pioneered and developed the wide-base principle for industrial pneumatics . . . made it standard for every industrial tire in the line . . . and the Army Air Corps, convinced that it made tires last longer, work better and easier . . . adopted wide-base Generals as standard for all ground equipment.

That's why the most modern material handling equipment, like the Bell Prime Mover, moves loads faster, easier, cheaper and better on Generals. Bell Aircraft Corp., Prime Mover Division, Buffalo, N. Y.

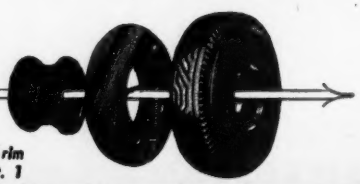


Wide Base
Modern design for passenger car tires.

Wide Base
Modern design for truck tires.

Wide Base
Modern design for modern materials handling.

The GENERAL TIRE



Available in complete assemblies of tire, tube and rim or tire only. For further information write Dept. 1

THE GENERAL TIRE & RUBBER CO. · AKRON, OHIO

Decentralized

YOU CAN BE **SURE** IF IT'S Westinghouse

Automatic Battery Charging

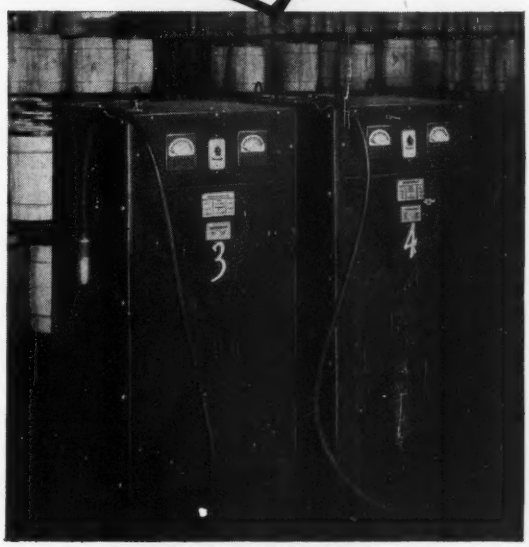
Cuts operating costs... gets more production from men and equipment...

It's the Rectox "on-the-spot" system... as simple as A-B-C

Trucks and operators on the job promptly . . . and on the job moving goods till the whistle blows . . . that's what you get with Rectox "on-the-spot" charging. No time lost traveling to and from a central charging station . . . no needless waste of battery power . . . no needless truck depreciation.

At day's end, operator simply moves his truck to charger, connects, and turns a convenient switch. Charger shuts off automatically when full charge is obtained. Truck is ready to go the next day . . . ready, *and on location.* Operator is assured of his own truck when he returns. He'll find the Rectox unit handy, too, as a boosting station . . . battery can be boosted midday or other intermediate hour without loss of productive time.

For full information, call your near-by Westinghouse office, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21464



Rectox 2-rate charging conforms to the specifications of the Electric Industrial Truck Association. Rectox units have no moving parts other than a fan for cooling. Maintenance is minimized. Long life and dependability are assured by more than 20 years of successful operation.

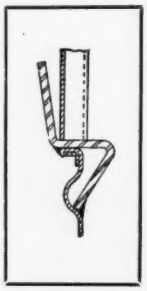
Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

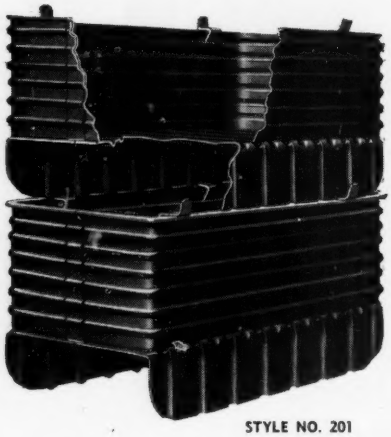
Rectox INDUSTRIAL BATTERY CHARGERS

POWELL PRESSED STEEL
TIERING AND CRANE TIERING BOX PLATFORMS

This supplementary sketch shows the detail of the POWELL Tiering Lug. Each lug provides ample bearing surface, thus facilitating the stacking of units. Lugs are securely arc welded as shown and so arranged that the load stress is carried vertically by sides of box and legs of platform.



By the use of POWELL Tiering lugs this Box Platform allows use of full size box, thus giving greater cubical capacity.



STYLE NO. 201

EXTRA HEAVY DUTY CRANE TIERING WELDED BOX PLATFORM

STYLE NO. 203

A welded Box Platform equipped with long crane lugs and bumper channel runners to meet extreme conditions where extra sturdy construction is necessary. The long crane lugs, which are securely riveted to box and platform, carry the load of the unit from the platform instead of from the box.

CASTER EQUIPPED BOX

Here we have a standard two-piece box equipped with either swivel or stationary casters bolted to pressed steel channels. This provides a live box for handling materials which can be moved by power lift trucks or by hand. This type of box can be made with casters bolted to a plate on the bottom of the box, eliminating channels for use where only a live box is needed.

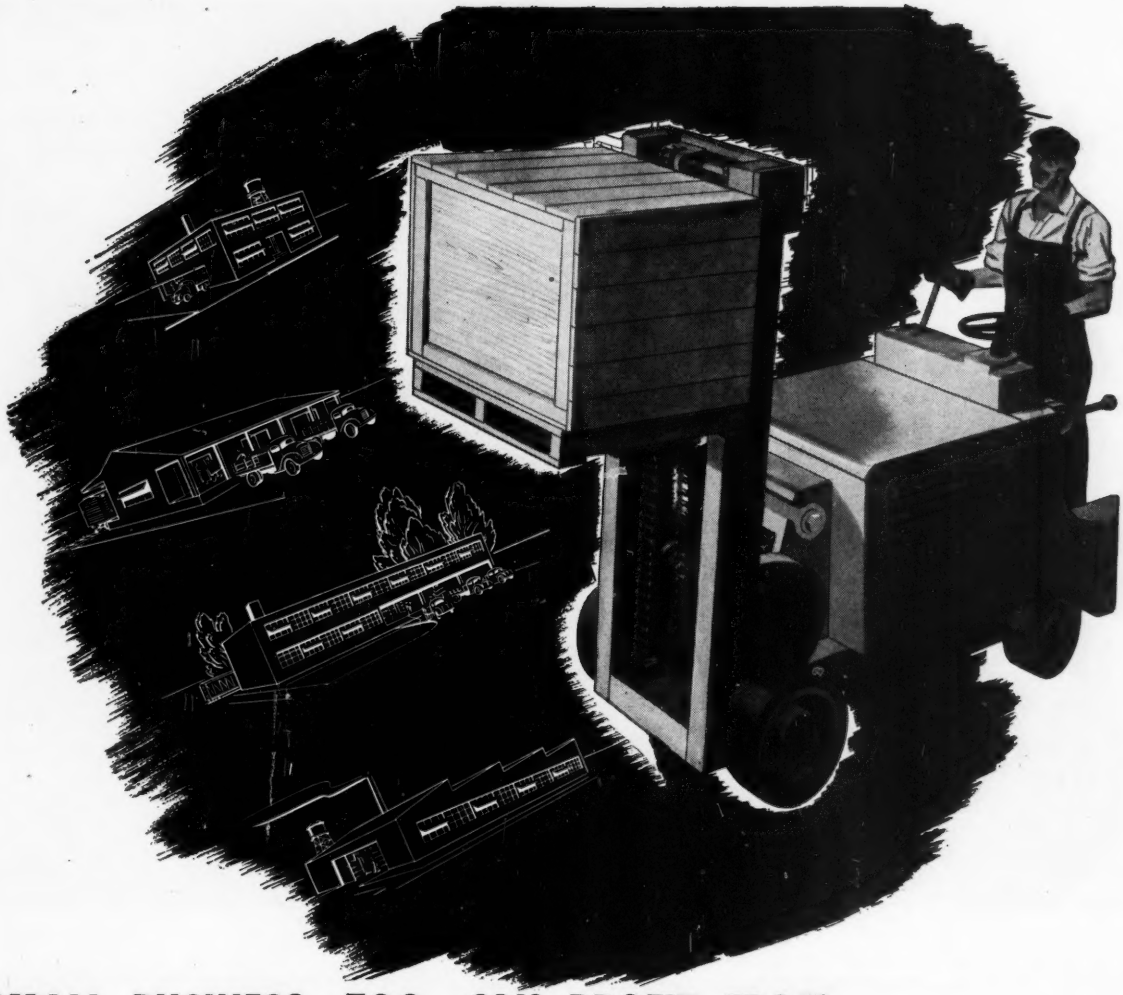
Other Designs of Caster Boxes can also be furnished.

STYLE NO. 309

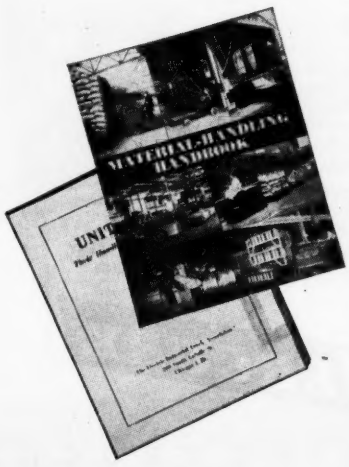
Representation in Principal Cities

THE POWELL PRESSED STEEL CO.—HUBBARD, OHIO

"ORIGINATORS of Cold Formed All Steel Handling Equipment"



SMALL BUSINESS, TOO, CAN PROFIT FROM *Electric* INDUSTRIAL TRUCKS



POSSIBLY you've supposed that your plant or warehouse lacks the work volume necessary to justify the use of an electric industrial truck. You may, then, be astonished to find, on analysis, that not only have you *more* than enough but that you've already paid for *several* trucks in needless handling expense.

ACTUALLY, a battery-powered truck can make such huge savings in comparison with manual handling that it need not be busy continuously to show a profit. *In many instances, a truck having no more than an hour's work per day can pay for itself in less than a year*—or in about a month and a half if kept busy all day.

TOO, there is the great versatility of this self-loading truck—its ability to perform moving and tiering operations many of which are beyond the limits of manual handling. For instance, high-stacking to save floor space, manipulating heavy and cumbersome machine parts, die-changing, charging hot furnaces, and countless other examples.

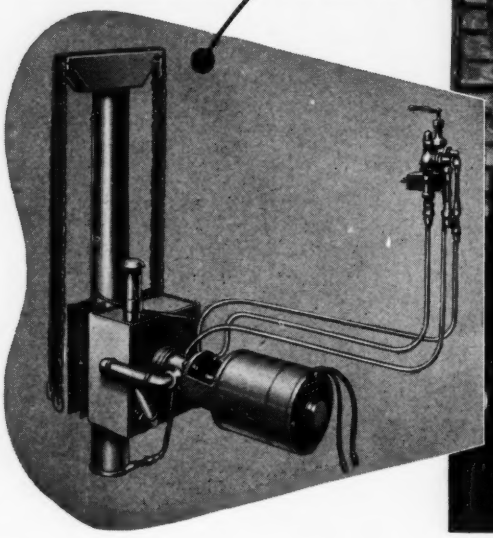
OTHERS in small business have found that an electric industrial truck demonstrates its wide usefulness and rock-bottom operating cost so quickly that the initial "one hour per day" soon grows, as does the production—and profits—of its owner.

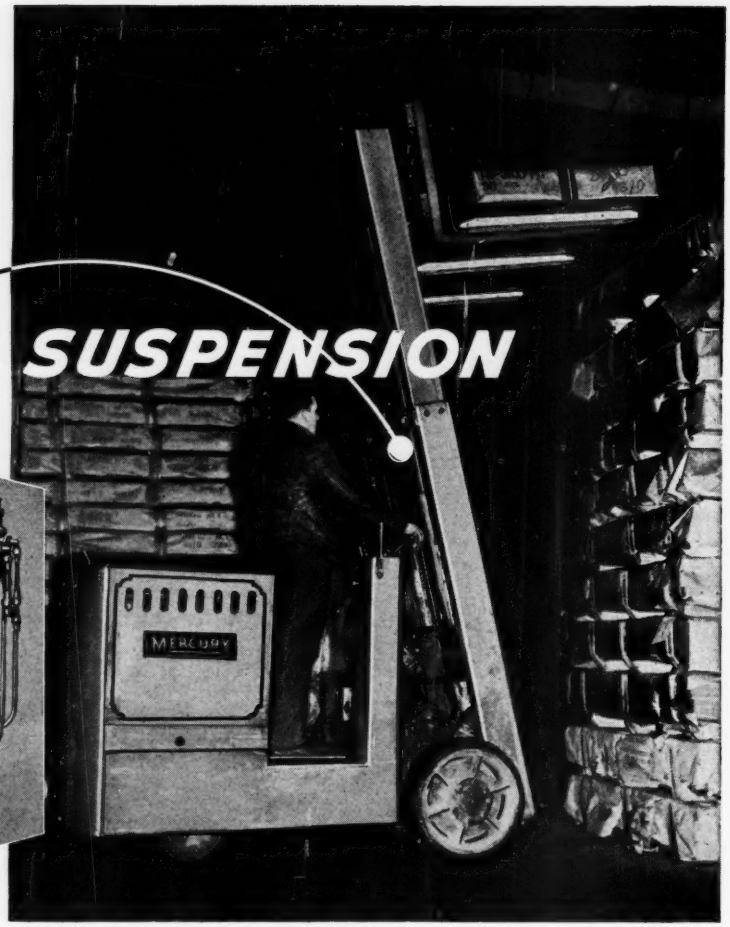
YOU will find many suggestions for substantial savings in the MATERIAL HANDLING HANDBOOK and in UNIT LOADS—free on request.

THE ELECTRIC INDUSTRIAL TRUCK ASSOCIATION

29-28L Forty-first Avenue, Queens Plaza, Long Island City 1, N.Y.

only the MERCURY Hydraulic Lift offers BALANCED SUSPENSION





Mercury engineers were the first to apply successfully the hydraulic principle to the lift mechanism of industrial trucks. The Mercury hydraulic lift offers these advantages:

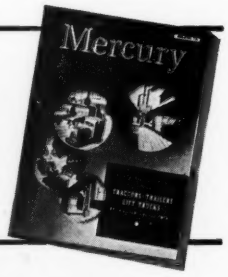
1. **Balanced Load Suspension:** *Patented* cross suspension of fork carriage eliminates unequal strains created by off-center pick up of loads.
2. **Simple Design:** Requires less than 50% of the usual number of moving parts.
3. **Economy:** No power required to lower load—no power wasted in lifting.
4. **Safety:** Relief valve provides complete overload protection at all times.

The soundness of the hydraulic lift principle, and the important advantages it offers, are today widely recognized throughout industry. The Mercury lift, however, in addition to providing the usual advantages of the hydraulic system, offers the exclusive and patented "Balanced Load Suspension" feature, which prevents side loading of the ram even with an off-center load.

Other outstanding features of Mercury trucks are: Single-unit drive assembly . . . Snap action, cam-operated controller . . . All welded frame construction. These are but a few of the many reasons why Mercury Industrial Trucks enjoy wide preference in industry.

FREE: NEW CATALOG NO. 7-11

Most comprehensive literature ever released by The Mercury Manufacturing Company. 52 pages—illustrating and describing the complete Mercury line. Complete with features, specifications and application. Request your copy on company letterhead.



THE MERCURY MANUFACTURING COMPANY
4154 South Halsted Street
Chicago 9, Ill.

MERCURY

TRACTORS • TRAILERS • LIFT TRUCKS

Harassed by shipping losses . . . breakage, pilferage, customer complaints? Maybe it's time to call in a Signode packaging and shipping engineer.

In their years of experience—working with shippers of all kinds of products and commodities, in all sections of the country—these packaging specialists have met and solved thousands of knotty problems, many of them similar to yours.

Regardless of what, where or how you ship . . . or how much . . . a Signode representative will be glad to show you how you can save money, improve customer good will with *Signode's System of Planned Protection.* For further details, write today.

SIGNODE STEEL STRAPPING CO.

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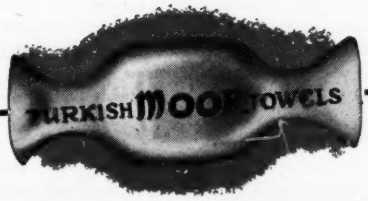

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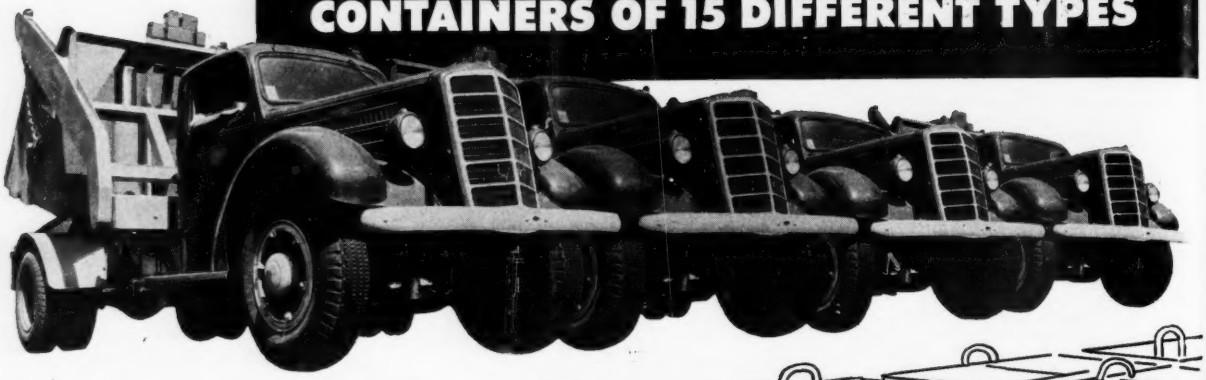
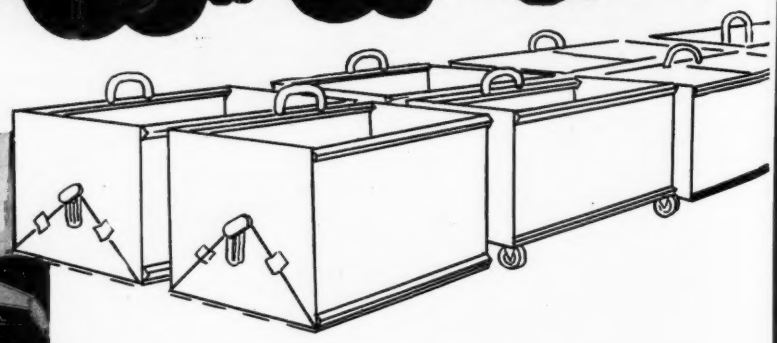
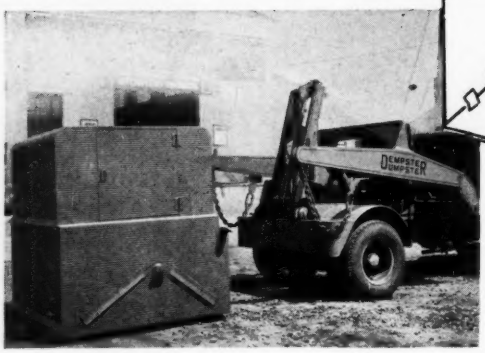
STEEL STRAPPING PROTECTS YOUR SHIPMENTS AGAINST DAMAGE

THESE FOUR TRUCKS HANDLE 88 CONTAINERS OF 15 DIFFERENT TYPES







Like many industrial operations, this refinery extends over many acres and handles great quantities of materials, in addition to hundreds of cubic yards of scrap and rubbish daily. Choosing strategic points for receiving material, the 88 containers were placed throughout the refinery, the requirements at each point determining the size and number of containers to be used. At some points for liquid, water-tight containers with lids were required. At others, light, bulky waste called for a big capacity, light-weight enclosed container. Some accumulation points were inside buildings. Containers on casters that could easily be rolled indoors were provided. Each container is assigned to one of the four truck hoisting units and, on a synchronized schedule, is picked up as soon as it is filled. Photos at left show: top-truck hoisting unit backing up to a 6 cu. yd. Universal container. The driver attaches two chains, and then, from controls in the cab, the container is hydraulically lifted into carrying position (see photo at left center). Arriving at the disposal area, the container is automatically dumped (see photo left below). The container is then returned to its original point for reloading and the truck hoisting unit moves on to the next container on its route. Pick-up and dumping operations require only a matter of seconds, thus it is possible for one man and one truck to handle any number of containers, keeping a steady flow of material moving without waiting or wasting time.

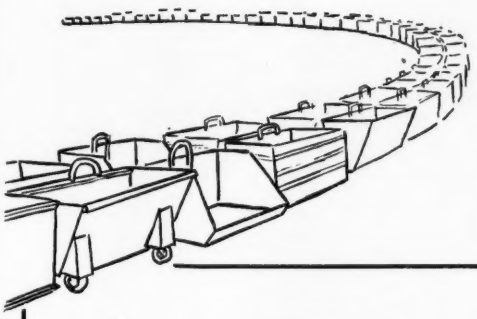
On opposite page are illustrated the types of containers in the original installation and the materials they handle. Note how easily the basic Dempster-Dumpster containers are converted for special purposes by the simple addition of lids, casters or some other special change.

The Dempster-Dumpster system is saving money in large and small plants alike. Its great flexibility makes it adaptable to any plant, regardless of size, and assures tremendous savings along with amazing improvements in efficiency. A survey of your plant, without charge or obligation, could reveal the amazing effectiveness of the Dempster-Dumpster System.

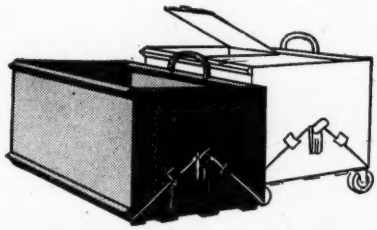
DEMPSTER BROTHERS, Inc.

. . . THIS IS THE DEMPSTER-DUMPSTER SYSTEM . . . SAVES THIS REFINERY $58,000 ANNUALLY

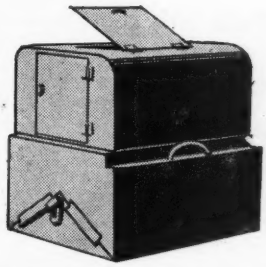
The Dempster-Dumpster System of Materials Handling, simply stated, permits the use of any required number of detachable containers, of various designs and capacities, to be serviced by a single truck. Its ability to effect tremendous savings in handling numerous types of materials has been definitely established in hundreds of leading industrial plants.



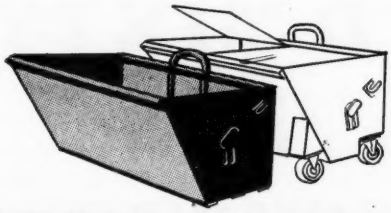
In this particular case, in a large refinery, four of the twelve trucks formerly detailed for materials handling, including scrap and rubbish collection, were equipped with Dempster-Dumpster Hoisting units to handle 88 detachable containers of 15 different types. The Dempster-Dumpster System of quick pick-up and dumping of pre-loaded containers has worked wonders in efficiency, plant appearance, and savings. In one year savings of over $58,000 was shown by our engineers survey. Time has proved the correctness of this survey. Since the original order of 88 containers, so many more uses for the equipment and greater savings were discovered that 55 additional containers have been placed in service with a grand total of 143 containers now being handled by the four trucks.



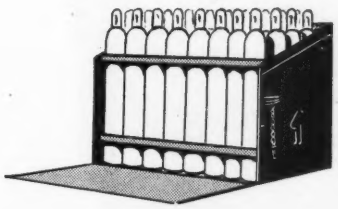
DROP BOTTOM CONTAINERS. 48 drop-bottom containers were furnished for handling trash and rubbish, steel turnings, scrap metal, tube ends and clay:—Twenty 6 cu. yd. open top type, one 6 cu. yd. with lids, nine 2½ cu. yd. open top type, two 2½ cu. yd. open top with casters, six 3 cu. yd. open top, nine 4 cu. yd. with lids, one 4 cu. yd. enclosed with hinged door in top.



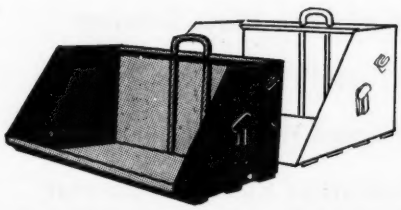
UNIVERSAL CONTAINERS. 13 universal containers were furnished for handling trash and rubbish. Universal containers feature completely enclosed construction, drop-bottom dumping, a door in either end for ground-level loading and a lid in the top for loading from a platform.



TILT TYPE CONTAINERS. 16 tilt type containers were furnished for handling general refuse, sludge and settlings:—Four 3 cu. yd. open top type, nine 3 cu. yd. with lids, three 3 cu. yd. with lids and casters.



SPECIAL CONTAINERS. 3 special containers were furnished for handling and transporting oxygen cylinders from one point to another in the refinery. This container is typical of the many highly specialized uses for which Dempster-Dumpster containers are constructed. Many other containers are available for handling almost any type of material known, be they liquid, dust, light or bulky or very heavy materials.



SKIP TYPE CONTAINERS. 7 skip type containers were furnished for handling refuse wax, oil, lube and coal:—Three 3 cu. yd. skip type with lid, three 3 cu. yd. skip type without lid, one 3 cu. yd. skip type with teeth.

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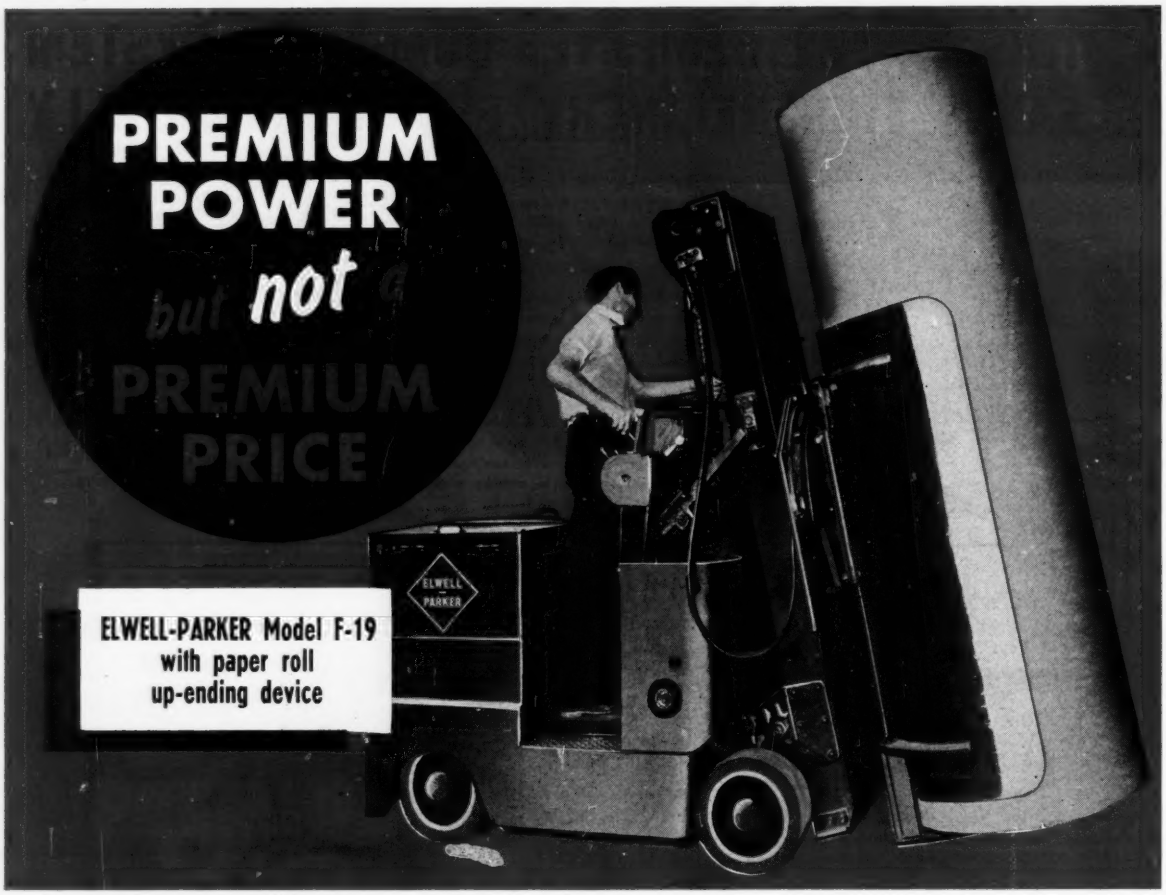

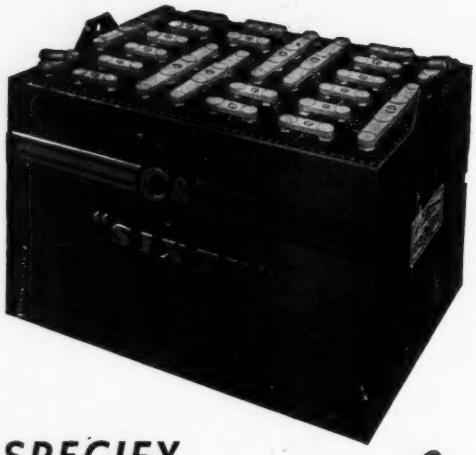

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A Business Dilemma to be Solved

By J. LEO COOKE,
President,
American Warehousemen's Association,
Merchandise Division
and
Executive Vice-President
Lehigh Warehouse & Transportation Company, Newark, N. J.

What Does "Distribution" Include?

The first order of business in lowering distribution costs is for an authoritative group to study and define "distribution" precisely. When we all have the same conception of the word, then, and only then, can we completely measure its costs and do something about them. Often there is no sharp dividing line between production or manufacturing costs and distribution costs.

Our industry, public merchandise warehousing, is an important segment of our distributive economy. It adds but an extremely small per cent to the cost of delivered products. It is an industry whose primary reason for existence is that it provides a less costly step in distribution than is available by other methods. But warehousemen must do more than provide storage space for goods. They *handle* them into and out of their facilities; and they have found that their primary task in reducing distribution costs is to *increase productivity* in their handling operations.

Mechanization is the tool that meets this need. In the public merchandise warehousing industry, where operators handle thousands of items of many sizes and shapes, it is impossible to standardize and mechanize as thoroughly as would a manufacturer making but one commodity on a production line basis. Warehousemen all over the country are mechanizing to the fullest extent possible and within the limitations imposed by the variety of goods they store and handle. We have found that it pays, as have many other industries.

I have said that mechanization pays. That should be qualified by saying that *standardized* and *integrated* mechanization pays. Haphazard and piecemeal tools and methods usually *increase* handling costs. The same applies even more to distribution in general.

A Three-Point Program

There is one method that is increasingly meeting with favor and success—the centralization of all physical distribution under one head. Companies concerned with the whole distribution picture, from raw product to consumer, are finding that a single "Director of Physical Distribution" is needed. He must be armed with sufficient authority to, first, study the company's problems and, second, *do* something about them. This is a direct means of effectively eliminating costly practices and duplication of effort. All phases of distribution are interrelated. Obviously, then, why not integrated distribution management?

Our specific tasks in the light of today's problems are:

1. To clarify our own and public thinking by *defining* and *agreeing* on a sound definition of "distribution".

2. Each distributive industry must recognize its own problems and apply mechanization intelligently and in coordination with others in the chain of distribution.

3. Those whose products are distributed must change their organizational set-ups to place responsibility for *all* physical distribution under one head.

When these three things are done, we shall have gone a long way on the road to solving one of the real dilemmas of American business.

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3-Star Show . . .

. . . THIRD ANNUAL INDUSTRIAL PACKAGING AND MATERIAL HANDLING EXPOSITION

Special program events include: 1. A Short Course on packaging and material handling, a novel feature arranged and conducted under the auspices of the University of Illinois. (This is the first attempt of its kind.) 2. A greatly expanded Contest covering five classifications of protective packaging. Prizes range from $25 to $500. 3. About 100 Exhibits of the latest in packaging material and techniques and related material handling equipment. For more details see pages 58 and 59, September FLOW.

Time and Place: October 5 through 7, Hotel Sherman, Chicago.

Use this listing of exhibitors as your guide to the Show.

Exhibitor	*Booth No.*
Acme Steel Co.	134, 135
Acorn Wire & Iron Works	11, 12
American Box Board	121, 122
American Excelsior Corp.	45
Otis Angier & Associates	101, 102
Angier Corp.	42, 43
Associated Cooperage Industries of America, Inc.	137
Automatic Transportation Co.	26, 27
Bonnell Publications	112
Brainard Steel Co.	50, 51
C.T.C. Industries, Inc.	34, 35 and 36
Carry-Pack Co., Ltd.	152
Chicago Mill & Lumber Co.	123, 124
Clark Tructractor Div., Clark Equipment Co.	77
D. C. Cooper Co.	49
Container Co., Div. Continental Can Co.	25
Dravo Corp.	1
Dri-Flo, Inc.	142
Thomas A. Edison, Inc.	13, 14
Fibre Drum Mfrs. Assn.	145
FLOW Magazine	2
Fox Paper Co.	52, 53
Gaylord Container Corp.	131, 132 and 133
General Box Co.	138, 139
Gerrard Steel Strapping Co.	7, 8
Gummed Products Co.	127, 128
Hertner Electric Co.	18
Huye Space Saving Box System, Inc.	115
Hyster Co.	75, 76
Industrial Tape Corp.	107
Inland Wire Products	19
Ironbound Box & Lumber Co.	3, 4
Jiffy Mfg. Co.	103
Kimberly-Clark Corp.	138
Laminite Products, Div. Criterion Paper Corp.	20
The Lanham Co.	48
Markham Machine Co.	56, 57
Marsh Stencil Machine Co.	116
Mid-States Container Corp.	111
Mid-States Gummed Paper Co.	119
Modern Materials Handling	58
Modern Packaging	114
Multistamp Co., Inc.	108
Nashua Package Sealing Co., Inc.	54
National Metal Edge Box Co.	140
National Wooden Box Assn.	125, 126
Nox-Rust Chemical Corp.	110
Nu-Way Sales Corp. of Illinois	9
Packaging Parade	106
Pack-Rite Machines	23
Powell Pressed Steel Co.	47
Rathborne Hair & Ridgway Co.	129, 130
Reynolds Metal Co.	24
Sefton Fibre Can Co.	10
Sherman Paper Products Corp.	143, 144
Shipping Management	109
Signode Steel Strapping Co.	28, 29
Stanley Works	104, 105
Towmotor Corp.	30, 31, 32 and 33
Traffic Service Corp.	120
Vanant Products, Inc.	46
Watkins Patents, Inc.	113
Weber Addressing Machine Co.	74
Wirebound Box Mfrs. Assn.	117, 118
Wood Conversion Co.	141
Yale & Towne Mfg. Co.	15, 16 and 17
N. A. Young Co.	5, 6

ONE-MAN WAREHOUSE

(for veneer)

The veneer industry is one among others which in recent years have modernized handling procedures and effected astounding improvements as a result. The Dean Company's one-man operation at its Kansas City associate plant, the General Mfg Co., has set a new goal for that industry. Full utilization of warehouse capacity depends on completion of the last step in over-all program.

Flitches are mechanically placed horizontally in storage. They are supported on 2" pipe. Compare this safe operation with the former method, below.

OLD type storage methods were both cumbersome and expensive. Veneer crates range in size from 7′ to 17′ long and from 12″ to 29″ wide and weigh up to 500 lbs. each. In the past, these crates were stored on end, and the handling was largely done by manpower. It was customary to move crates of veneer before the particular flitch (or bundle) desired could be reached.

Here are the detailed methods developed by The Dean Co. to effect its revolutionary warehouse.

Old-fashioned method used for handling crates in storage. New method is easier, safer.

Steel Strapping Simplifies Crating

As the veneer comes out of the dryer, it is automatically measured by an electric eye device. The sheets of veneer are removed and placed together in the same sequence in which they were cut. The material is then placed between two sides of a crate which has been previously tailor-made for the particular flitch. Before banding the bundle together, an identification tag is placed between sheets at one end of the flitch. The tag is perforated so that it can be torn in half. The steel strapping is then applied, while the bundle rests on skids. The runners are spaced several feet apart, which facilitates the banding operation.

The flitches are banded with ⅝″ x .020 steel strapping. The number of straps put on a crate depends on the thickness and width of the flitch. The strapping replaces the old method of crating on all sides and is now in general use in the veneer industry. This method has reduced crating time and packing expense, and developed a finished case of lighter weight.

From the skids in front of the dryer, the bundles are transported by a fork lift truck—in a one-man operation. The truck operator is the only one needed to handle the veneer to and from and inside the warehouse. He trucks the crates one at a time from the dryer and places them horizontally in the appropriate bin, as shown. As soon as the flitch is in place, the operator tears off the bottom half of the tag and fills in the location. He turns in all tags to the office at the end of the day.

Warehouse Planned For Handling

Company engineers designed the warehouse for the fork lift truck operation. The aisles were made 11 feet wide. The longest crates can fit in the aisle because the bottom bin is left empty. Although it was found that the truck was able to

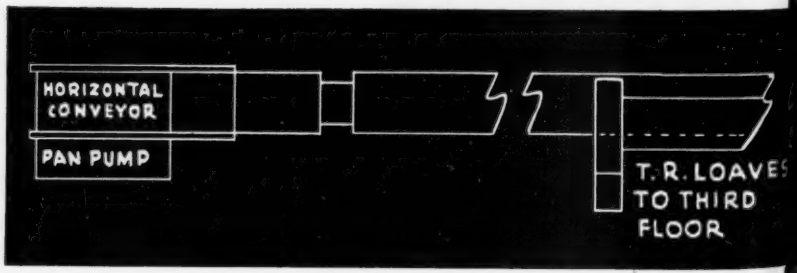
(Turn to page 33)

Tootsie Rolls
ON CASTERS and CONVEYORS

Large-scale candy manufacture depends traditionally on continuous conveyor flow—and on castered equipment for transfers between lines. Tootsie Roll production illustrates the effective use of both types of equipment, as well as good layout.

▲ THREE-CASTERED BUGGY moves hot batches from vats. Note permanently attached lid on truck.

FLOW SHEET of oven line with extruder at end and overhead return line (broken line). ▶



HUNDREDS of thousands of pounds of candy move each week over the processing lines at Sweets Co. of America, Hoboken, N. J., manufacturers of the well-known Tootsie Rolls. Upon completion of cooking, the liquid Tootsie Roll batch is discharged into a copper pan which is spotted on a three-castered buggy, as shown.

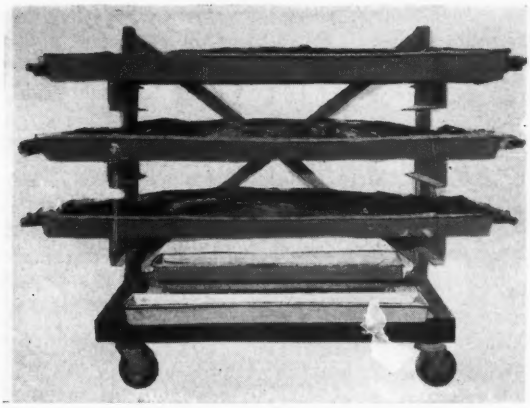
For easy steering and rolling, the three casters are of the swivel type and have rubber tires. The handles of the pan fit snugly into the notches provided at the sides of the superstructure. The "snug fit" prevents the pans from shifting during transit—an important safety feature since the temperature of the candy batch is 260 degrees F. Accidental contact with the hot mass is forestalled by use of a lid, hinged to the angled tubular handles of the truck. The lid is lowered on the loaded kettle while being transported across an aisle to the cooling tables. Thus a sanitary and safe operation is assured, and no one need waste time searching for lids, which are permanently attached to the batch trucks.

Castered Carts, Steel Band Conveyor

In the manufacturing department on the fourth floor the flow

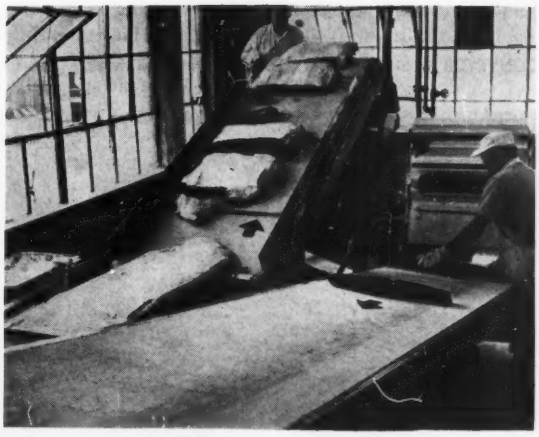
during primary processing is north to south. Usually two batches, totaling about 170 pounds, are poured on each cooling table. After cooling, the solidified slabs of taffy-like candy with a chocolate flavoring are transferred to the pulling machines. This is accomplished by means of 1-2-1 castered tables with four-inch wheels, also rubber-tired for easy rolling. The slab or paste buggies are 30 inches high, which is approximately the height of the cooling tables. The pulling machines knead the batches to the desired consistency. The operation completed, other castered equipment is used to make transfers to subsequent operations. A 24" x 60" flat pan is rolled up to the pulling machine on a stainless steel castered buggy. The top of these mobile units is at the same height as the level of the pulling machine beds. When the pan has been loaded, the unit is wheeled south to the oven trucks, which are lined up along a wall at the north end of the room. (Individual moves are usually within 50 feet.) These trucks serve for temporary storage purposes until the candy can be fed to the oven—hence the name "oven trucks." These load carriers roll on 4" x 4" rubber-tired casters and have angle iron racks projecting from one side of the superstructure to support three of the large pans. This temporary storage area for the paste is near the longitudinal east wall of the room, along which the conveyor line travels that moves the batches through the oven.

Of interest is the method of feeding the 170-pound slabs to the oven line, whose starting point is a 36-inch powered canvas belt about 12 feet long. The individual loaded pans are rolled up to it, alongside an electrically operated dump table

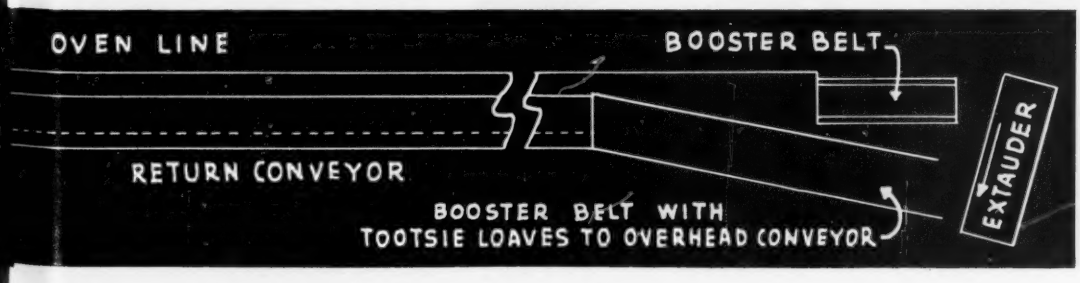


CASTERED OVEN TRUCK with large pans for paste. Small pans attached to side catch overflow.

CASTERED TABLE brings pan to dump table. Belt conveyor delivers paste to oven steel band.



CONVEYOR BELT, left, delivers to extruder, and latter to belt in foreground, reversing flow.



which is parallel to the line. The five-foot long pan is slid on the table and the handles are secured with a clamp on each end. A push button control then tilts the table, dumping the heavy slab on the moving belt. The installation of this dump table has eliminated a heavy physical job, which used to require two men to lift each load and dump it by turning the pan. When emptied, the pans are returned to the oven trucks to receive further slabs of candy from the battery of pulling machines.

Meantime the long, taffy-like mass advances on the canvas belt to the oven built over the line running along the wall. First comes a sizing operation. The candy travels under a flattening roll, then moves onto an oven steel band (32" x 182'), which is powered by a three H. P. motor. The material travels at approximately 12 F. P. M. through the oven, which removes moisture that was not taken out in the original vat cooking.

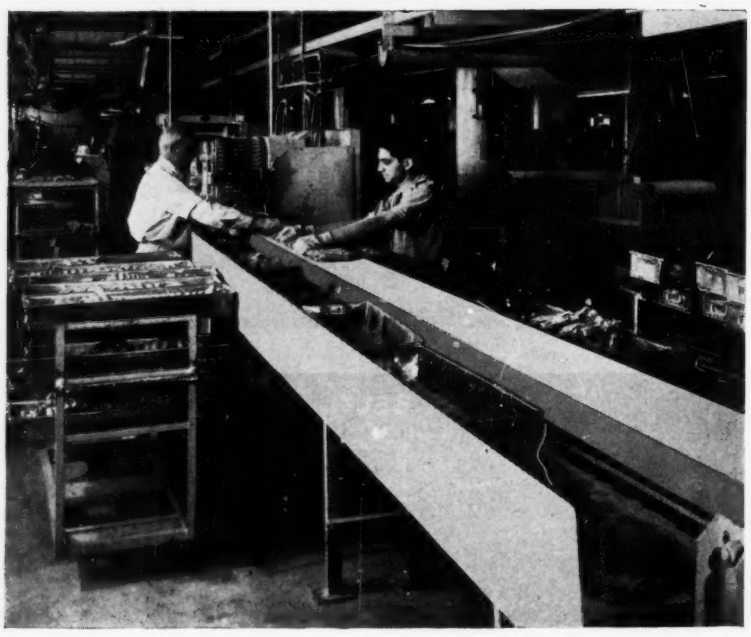
The oven line ends near the lateral wall at the far south end of the room, from where the material is cooled and returned north again. The arrangement for accomplishing this reverse flow is shown in the accompanying flow diagram. Following is a step-by-step description.

Reversing the Flow—Overhead Travel

The baked candy slabs emerge from the oven on a booster belt, which feeds to the extruding machine. The latter is so positioned that its delivery feeds to a second booster belt (parallel to the first one mentioned), which transports the emerging loaves to an endless 36" canvas belt (running north) about 24 inches above the enclosed oven line. A loaf, incidentally, is a 30-pound section of the original slab. Note that the flow through the extruding machine is utilized to effect the transfer from one conveyor line to the other, and that the second booster belt provides a convenient arrangement for feeding the loaves to the overhead canvas belt conveyor. Thus no floor area is used for routing the loaves north.

At a point about three-fourths of the distance of the oven line, the loaves of candy are discharged via a 60-degree chute to a table, which is a distribution station. An operator removes the candy and routes them in either of two directions, as follows. 1. For small-size Tootsie Rolls. The loaves are dropped down a spiral chute, which terminates at a canvas belt conveyor on the floor below, where further sizing is performed. 2. For large-size Tootsie Rolls. This material is placed on three-walled castered trucks, which are wheeled to another chute. The latter delivers to the sizing and subsequent packaging operation on the second floor.

CONVEYOR DELIVERY from forming machine, with pans on each side; three-deck caster trucks receive full pans for transfer to next operation.



Considerable interest attaches to the packaging of these Tootsie Rolls. The method used for the five-cent (large) size is described in a separate article, this issue, in the Packaging Mechanics Section. To give you an idea of both phases of the operation, the remainder of this article will describe the flow through the sizing operation for the small-size candy.

Methods That Eliminate Fatigue

On the third floor, the loaves emerge from the chute on a 30-inch canvas belt which feeds the sizing machine. The material is formed between steel guides to a certain width and length, then passes under further flattening rolls. The sized loaves than pass under drums which have sizing and cutting grooves. The latter form the candy into pre-shaped rolls which are linked to each other along their sides. (The grooved drum is designed for this purpose.)

The linked rolls emerge on an eight-inch belt which runs in the center of a stainless steel table. In recessed areas on both sides of the belt 30-inch-long pans are placed. These are filled by operators on both sides of the line. Defective shapes remain on the belt and are carried into a chute at the end point, from which the material is conveyed to the central salvage system. The latter delivers it back to the fourth floor for reprocessing.

Each major processing station has its own salvage conveyor, which feeds to the central salvage system. This instant and continuous disposal of salvageable material contributes to the general sanitary practices observed throughout. No material to be reprocessed need remain standing about in stationary containers.

The full pans from the delivery of the sizing machine are disposed of on castered triple-deck shelf trucks, shown in one of the photos.

(Turn to page 71)

Is HANDLING a Help or a Headache?

MODERNIZE WITH TOWMOTOR M H*

*M H is Mass Handling, the systematic movement of the most units, in the shortest time, at the lowest cost.

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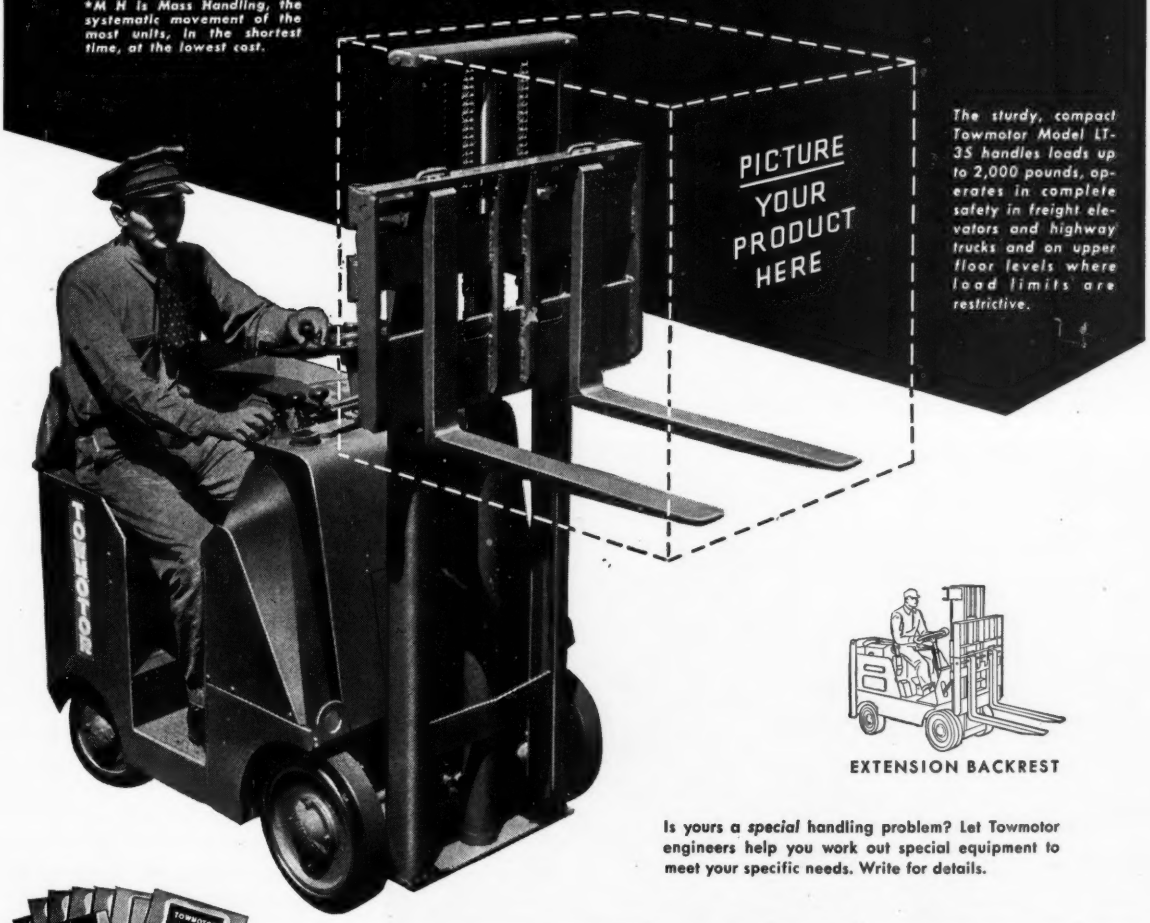

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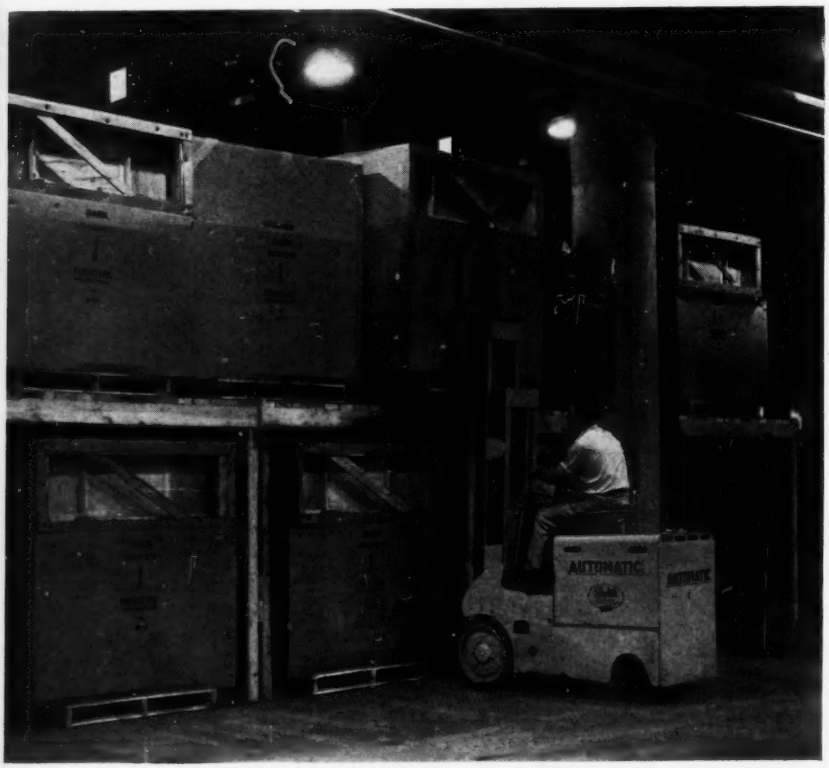
"Keep Everything Movable" . . .

. . . in a furniture warehouse

PALLETS, FORK TRUCKS, RACKS
BELT CONVEYOR, CASTERED DOLLIES

Here's a pallet operation in a retail furniture warehouse, one of the first of its kind. Special storage racks, pallets rolling on swivel casters, pallets with extension boards, tierable wooden horses—these are some of the cleverly engineered accessories that adapt the program to the hundreds of types of furniture and electrical appliances handled. A parcel classifying and distribution system is a separate feature.

THESE ARE stationary racks for bulky palletized furniture which can't support weight.

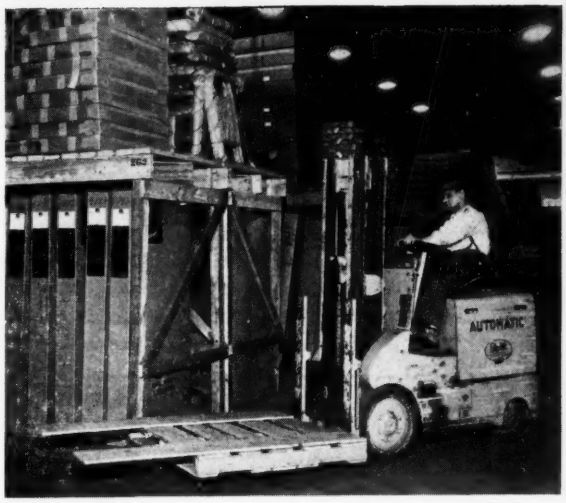


"KEEP everything movable." This summarizes the principle engineered into the material flow and handling facilities of the new hard goods warehouse of Goldblatt's Department Stores, Chicago, which started operations in May of 1947.

Goldblatt's operates stores in several midwestern states. The furniture and major electrical appliances warehouse, discussed here, was designed to serve the company's stores in the Chicago metropolitan district.

The new plant is one of the first furniture warehouses with a pallet handling program designed for the retail business. It is a two-story structure with a basement and comprises 360,000 square feet overall. Of these, 100,000 square feet are taken up by a garage for the company's truck fleet. The square of the first floor of the warehouse proper is 375′ x 435′, with approximately 50 per cent of this space allocated to car and truck receiving facilities, a truck pit, shops, and an order assembly area.

The following construction details have an important bearing on the handling operations. Located on a main traffic artery, the plant is conveniently accessible by truck to all parts of the city. The building runs north and south. A covered double track rail siding on the east side has a 12-car capacity, with a third track for fuel oil going direct



▲ **PALLET WITH** extension boards for mattresses. These units are usually moved by hand truck.

▲ **PARCEL CLASSIFICATION** with sorting bins in rear. This is a very efficient layout for job.

to the boiler room. The 15-foot-wide freight car dock is ample for all fork truck traffic, as well as for temporary storage purposes if this should be necessary. The truck receiving platform is continuous with the car dock and its eight doors assure that vehicles will not be kept waiting.

With all receiving facilities on the east side of the plant, shipping is on the west side. This means that all merchandise flows progressively west from receiving through the storage bays, the inspection and preparation shops, to order assembly and into the outbound highway vehicles.

The brick walls are surfaced extensively with glass block to admit light, and forced feed ventilation is used. The first and second floors have 18′ ceilings and merchandise is stacked to a height of 16′ (in conformity with fire prevention regulations). The basement, which has a standard 10′ ceiling, is used for merchandise that is stacked manually.

The building is equipped for an ultimate total of six elevators several of which are now in operation. These hydraulic elevators of 8000-pound capacity, each with a 9′ x 14′ platform, are self-leveling and have safety gates. When the building will be raised to the planned five stories, additional elevators will be installed. (With a store development program planned, the ware-

PALLETIZED CHAIRS transported from incoming car to stacks. Note the two-pallet load here. ▶

house is designed to serve several additional stores that are scheduled to be built.) The bays are 25′ x 25′ center to center and aisles are 11 feet wide.

A thermostatically controlled zone system of heating makes it possible to control the temperature in individual parts of the building, thus not requiring the maintenance of a uniform temperature throughout. This feature is a great fuel saver.

STACKS OF appliances illustrate neatness, safety, use of cubage throughout warehouse.

LOW-BED CASTERED TRUCKS like this were shortened one foot to fit crosswise in elevators.

A loud speaker system, with outlets in all major operating areas, is used for announcing meetings, conveying special notices or for paging purposes. Valuable time is thus saved.

Use Only Two Pallet Sizes

The principle "keep everything movable" has many interesting ramifications in a warehouse such as this one where a highly diversified line comprising many odd-shaped items is handled. The range may be indicated by listing the smaller wall mirrors and portable radios and, on the other end of the scale, 72-inch mattresses and cooking ranges weighing hundreds of pounds each.

At the time the preliminary study was made to determine the pallet sizes that would be necessary for this large variety of merchandise, it was decided that two sizes should be economically adequate. While the original decision was carried out, this feat was made possible to some extent by use of some auxiliary equipment and certain accessories that were designed by the warehouse personnel.

The two pallet sizes decided on were 48″ x 48″ and 48″ x 60″. Rolling equipment used is as follows. Two fork trucks of 3600-pound capacity with a 96″ lift; one fork truck of 3000-pound capacity with a 84″ lift, and one 4800-pound unit with a 109″ lift. Unloading and transferring tasks are done by the equipment having the lower lifts, while the high-lift truck does all the stacking in the warehouse. Supplementing this equipment is a fleet of 12 powered hand pallet trucks. These are used throughout the plant both in conjunction with the stacking type trucks for order assembly, shipping, and in many routine tasks involving short moves.

Implementing the Principle

The previously mentioned accessories go a long way toward explaining the principle "keep everything movable." For example, certain types of items not palletized are unloaded on six-castered, low-slung rubber-tired trucks which have a 4′ x 8′ platform. These load carriers were cut down from their original 4′ x 9′ size so that they could be placed crosswise on the 9-foot-wide elevator platforms. These units are also used for moving goods received in small quantities which, because of loss of cube, could not be palletized economically. Another type of castered equipment is rack trucks for transferring linoleum rolls from the inbound cars. These long, heavy rolls are safely retained in these load carriers during movement to the second-floor storage bins.

Because of the many bulky and sometimes unwieldy shapes handled, a special fixture was designed, which is basic to the entire pallet program. It makes possible full utilization of the cube in stacking merchandise which has either uneven contours or cannot support weight for other reasons. While such merchandise may consist of individual uncrated items, they are nevertheless stacked to the same height as those in the bulk storage aisles.

These pallet racks, shown in the photos, are used in three different ways. 1. For mattresses and bed springs in the bedding department. 2. Bulky furniture. 3. Along the truck shipping dock, where the merchandise is placed for next day's delivery. Pieces of 4″ x 4″ lumber are crossbraced with 2″ x 4″ and 2″ x 6″ lumber and serve to support the 10-foot-long shelves which are seven feet off the floor. On the racks in the shipping department, the units have crosspieces just below the storage deck, on which excess loading boards are stored that cannot be used by the delivery trucks. Because of their size, these racks are adaptable to any type of merchandise handled in the warehouse.

The storage method for bedding

may serve as an illuminating example of the value of these racks. The bed springs are stood up vertically in the lower tier, while the mattresses are piled flat on the top deck. Good product protection is thus maintained, order assembly is facilitated and use is made of the cube in stacking items that could not otherwise be tiered.

Box pailets, or portable pallet racks, are another type of load carrier employed. These units are usually set up at the ends of bulk storage aisles. Each of the three pallets in a tier may contain several one-of-a-kind items. The vertical members are bolted and can be adjusted to merchandise of different heights. Confined within these pallet boxes, the goods are maintained in orderly stacks besides being protected against damage. Again, housekeeping benefits and effective use is made of the cube.

In a warehouse such as this where hundreds of items of furniture are handled, a good deal of inspection and preparation of individual pieces is necessary prior to shipment to customers (or stores as floor samples). For moving items-in-process of this kind a number of 48″ x 48″ pallets have been equipped with four swivel casters. The furniture pieces are thus wheeled from station to station, and then to the shipping dock. Since these fragile items, easily marred, do not have to be removed in the process, the use of the caster-equipped pallets lessens the possibility of damage as well as the need for lifting and other physical handling tasks.

Other load carriers implement the movability principle. One item handled is 72-inch mattresses. If loaded on the standard 48″ x 60″ pallets, there would be an overhang of 12 inches (which would of course entail damage to this merchandise). Here is the "compromise" accessory that was designed. Nailed across the regular 48″ x 48″ pallets were 70-inch-long (1″ x 12′) extension boards. The latter are nailed flush with the deck at one end where the load carrier will be picked up by powered hand pallet

(Turn to page 61)

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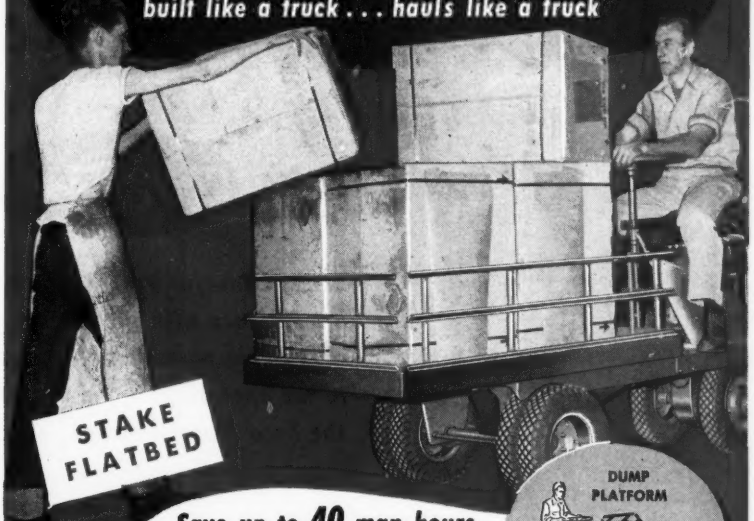

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WORK CARRIER EFFICIENCY FOR *Conveyor Efficiency* at Ford Motor Co.

Empty conveyor work carriers mean loss of conveyor capacity and interference with production. A little ingenuity goes a long way in carrying parts safely, economically and with maximum benefit to the operations along the path of travel. These examples from the Ford Motor Company's Tractor Division are both stimulating and useful.

MAXIMUM use of overhead chain conveyor capacity is determined to a large extent by the efficiency of the hooks or work carriers. Chain conveyors in assembly type plants frequently carry a multiplicity of different parts, and an efficient operation results when the adapter hooks are designed to the products being conveyed. By the same token, conveyor capacity is lost in cases where the proper amount of consideration has not been given the work carriers in planning the over-all installation.

Elaborate Designs Are Costly

This description presents several conveyor work carriers used on chain conveyors in the Ford Motor Company's Tractor Division, Highland Park, Michigan. These hooks are typical and illustrate the following desirable features: 1. Simplicity of design. 2. Adaptability to various types of parts. 3. Safety to personnel and products. 4. Easy loading and unloading. 5. Effective processing.

Here are some general facts on the conveyors and the parts being carried. The principal line from which most of the hooks were chosen has a length of 2800 lineal feet, with 1400 work carriers on 24" centers. Only eight different types of hooks carry the 60-some parts from machining through washing, painting, and thence to the final assembly line. The parts, forgings and castings, range in weight from about ½ pound to 109 pounds each. (Three smaller conveyors are tied in with the larger inter-plant conveyor.) The main inter-plant line is timed so that 125 hooks pass each loading point every hour. It makes one complete cycle every two hours, or four cycles per shift.

In the planning stage, simplicity, safety and interchangeability were among the major considerations. The hooks had to be adaptable (within limits) to different parts of similar contour; otherwise the resultant complexity of designs would reduce conveyor capacity and interfere with handling efficiency. For example, if a particular part runs only every 200 or 300 feet, conveyor capacity is used to maximum advantage by operators who hang other miscellaneous parts at intermediate points on the same hooks. Thus an uninterrupted flow of work is maintained between processing departments and final assembly.

Ford Tractor engineers did not develop the present simple designs without trial and error. The first hooks, somewhat elaborate, were studied and found to require too much time in loading and unloading. An elaborate hook, which may be made in the tool room, is also expensive. As a result, the early designs were simplified, and the safety factor was given special attention. Safety is no mere phrase at the Ford Tractor Division. Every hook design must have the approval of the Safety Department; without this approval, preceded by

Photo of clever tire hook. Drawing, Fig. 6.

tests, a hook cannot be produced or put into operation. The tests

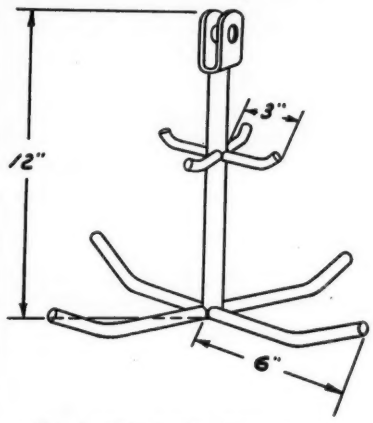


Fig. 1. This is miscellaneous parts carrier.

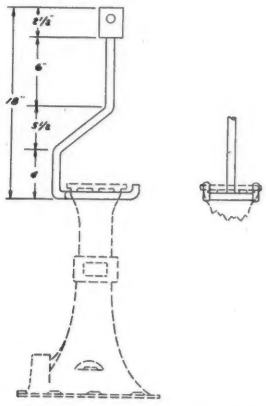


Fig. 2. Hook for rear axle housing. 67 lbs.

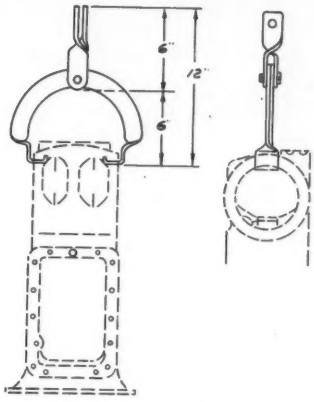


Fig. 3. Ice tong type carrier for heavy parts.

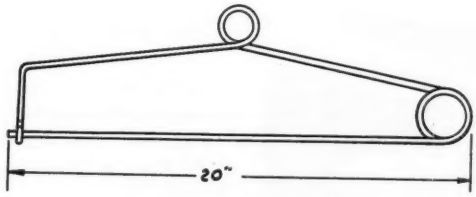


Fig. 7. Ingenious safety pin for small parts.

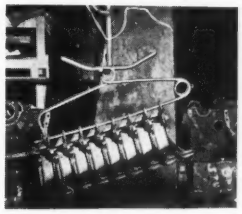


Photo shows the safety pin, left, in use.

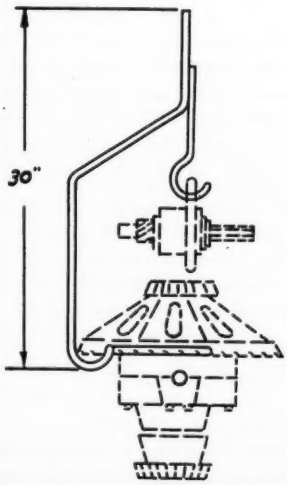


Fig. 4. Simple carrier for a complex part.

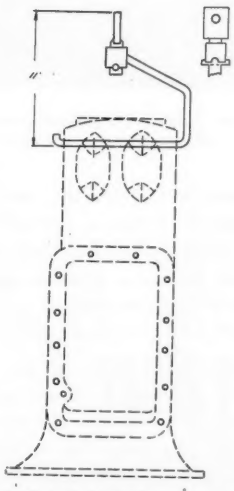


Fig. 5. Swivel hook for rear center housing.

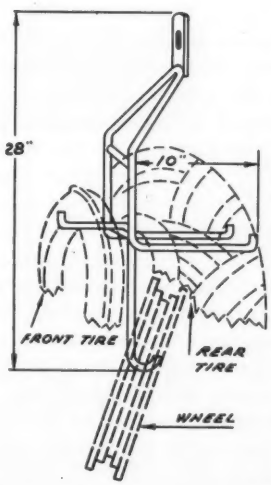


Fig. 6. Hook design for tire, front wheel.

are made for (a) angle of suspension, (b) stress and strain, (c) feasibility of a man getting hurt in loading or unloading a part, and (d) security during travel. The safety department has the last word.

Ingenuity and Simplicity

Figure 1 is typical of the multi-pronged hooks used for miscellaneous small parts. This one has a double set of four prongs, the smaller set of 3" prongs above the larger set with 6" prongs. Smaller parts are hung at the top, larger ones below. The retaining members are inserted through holes in the parts being conveyed. Thus safety is assured and the eight individual prongs carry a maximum number of items per lineal foot of conveyor chain.

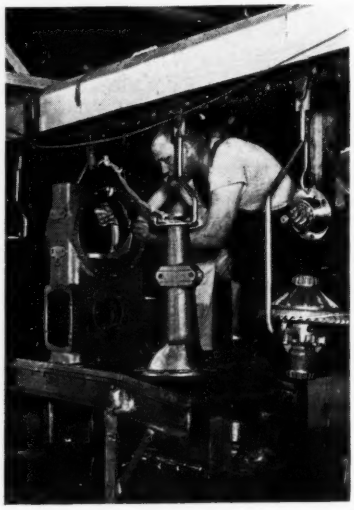
While miscellaneous items weighing as little as ½ pound each are carried on the prongs of the hook in Figure 1, the rear axle housing shown suspended in Figure 2 weighs 67 pounds. The support is horseshoe-shaped, and suspends the housing from the bottom flange of the part. The principal dimensions are given in the drawing, as in all the other examples. It will be noted that the stock used for construction of the work carriers is for the most part ⅝" cold rolled steel rod, except for the ⅜" stock used for hooks carrying the smaller parts.

Figure 3 is an ice tong design. This one carries the center housing, which weighs close to 100 pounds. In the unloading operation, use is made of the semi-automatic feature of this carrier. At the unloading point, a gravity roller discharge table is installed under a vertical curve, or dip, of the conveyor. The traveling piece is deposited on the rollers, relieving the tongs of the weight. As they open up, the operator merely manipulates the work carrier from side to side. This is enough to disengage the piece, which rolls ahead on the gravity rollers to the first subassembly station.

It will have been noted that the operator does not have to lift this heavy piece. The discharge points for other heavy castings are arranged similarly. They are at standard heights, with the conveyor dipping over them to release the part upon contact with the rollers. The operators merely slide the castings forward to the assembly point.

Safe Transport, Product Protection

Figure 4 shows a dual work carrier used for conveying the pinion gear assembly, a critical part whose machined surfaces must be protected against the slightest scratch. The main part of the assembly, the differential, is supported at the bottom by a horseshoe-shaped carrier similar to that shown in Figure 2. The dual member is the added hook (at the top) which is threaded through a hole in the flange of the pinion. (The slightest scratch on a machined surface would be enough to cause a defective rear axle assembly.) Thus both delicate pieces, matched ground, are suspended from non-critical points and carried with complete safety.



Conveyor descends to unload heavy pieces without lifting by operator.

Another variant of the useful horseshoe design is shown in Figure 5 (which is on one of the three smaller auxiliary conveyors mentioned previously). The feature of this carrier is that it is of the swivel type. The purpose is to permit operators to unload this casting (rear center housing) from all four sides. Usually the part is hung on from one side and removed from the opposite side of the conveyor. A slight effort swivels the relatively heavy casting in any direction, facilitating its removal in the desired direction. The swiveling member of the carrier is notched so that the piece remains in a rigid position during travel.

The meaning of maximum utilization of conveyor capacity is also well illustrated in Figure 6. The 10"-long dual prongs extending horizontally from the vertical member were the only retainers originally incorporated in this design. This carrier was specifically made for carrying large rear tractor tires from the car unloading platform to the assembly point in the plant. Wheels and the smaller front tires were brought to the wheel subassembly point by intermittent handling devices. For a time the possibility of installing a second conveyor for the two additional parts was also being considered, but this was not found feasible because of the limited floor area available.

Outstanding Examples of Design

Material handling engineers of the Ford Tractor Division then studied the conveyor carrier, and it was realized that a simple addition would enable the same hook to carry one front wheel and one front tire as well. A design was worked out, submitted to the Safety Department, and, upon approval, incorporated as shown in Figure 6. One length of ⅝" round stock, bent at right angles, was welded at the bend to the bottom cross piece of the original carrier. As shown, the small front tire is now carried on the horizontal member of the added hook, while the wheel is supported on the hook shaped at the bottom of the vertical part. Thus the original rear tire conveyor is now doing triple duty by carrying the two additional parts.

Figure 7 shows a novel-appearing safety pin design, which has made an improved washing job possible. This carrier is used for certain small parts, which were previously car-

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ried in metal containers through the washing process. Two drawbacks developed. The container was too heavy to be hung on the conveyor without strain, and, due to the fact that it swiveled in the washer, the washing was not up to inspection standards. Material Handling Department engineers studied the possibilities and came up with the safety pin, which has a 20" over-all length. Up to 15 parts are strung on the pin, and the result is a thoroughly satisfactory and uniform wash. The loop at one end provides the spring tension necessary for positive closure, the latter being much like that of an ordinary safety pin. The carrier is suspended from the conveyor chain by means of the eyelet in the center of the top member.

These examples from the Ford Motor Company's Tractor Division eloquently illustrate the importance of conveyor work carriers which are designed to the products being carried. 1. Full utilization of conveyor capacity is realized because "universal" type of carriers minimize empty hook travel. 2. Utmost simplicity characterizes all designs. 3. Safety is another major consideration. 4. The needs of processing are effectively served (as in the example of the safety pin). 5. Easy loading and unloading are assured by (a) functional design and (b) conveyor dips over gravity roller tables, a combination which makes lifting of heavy pieces unnecessary.

Properly designed conveyor work carriers can make the work easier and safer, and thus have an important bearing on production schedules and sound personnel relations.

DON'T MISS OUT - - -

FLOW'S second Cost Analysis Contest closes Nov. 15. Eight prizes totaling $1500 are offered. First prize is $500. Write FLOW, 1240 Ontario St., Cleveland 13, for your entry blank . . . . and HURRY.

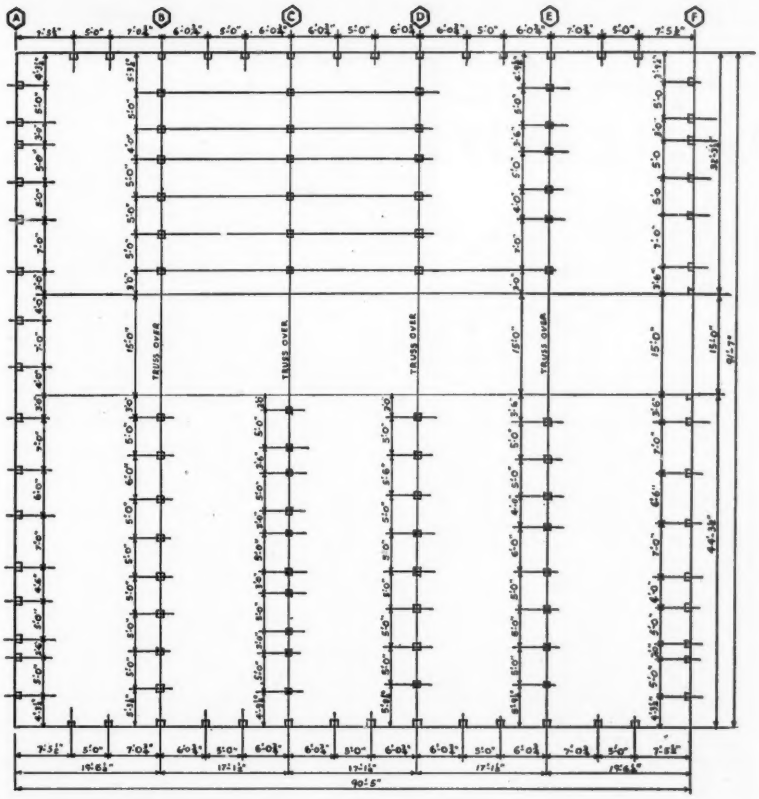
ONE-MAN WAREHOUSE . . .

(Continued from page 19)

maneuver in a narrower space, experiments proved that extra space should be allowed for faster handling. The floor plan shows the arrangement of aisles, bins, and bays. These are numbered and lettered for ease in picking out the crates, in conjunction with the identification tags described previously.

The horizontal storage method at once represents the trail-blazing innovation and the forward thinking of the Dean Co. executives. (Note, by comparison, the cumbersome end storage method formerly used.)

The veneer is supported on 2" pipe, which extends from 10" x 14" timbers. The height of each tier is determined by the average width of the crates as predicated on previous experience. Likewise, the spacing between the post of each aisle is proportioned so that flitches of the expected lengths will be adequately

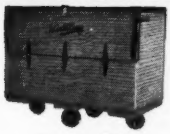


Warehouse floor plan with aisle and bin locations for crated veneer.

Is your Materials Handling **ACCIDENTAL** *or* **ENGINEERED ?**

Dolly & Flat Trucks Low Platforms

Two Wheel Trucks



Box and Four Sided Trucks

Three Sided Superstructure

Shelf Trucks

Non-Tilting Platform Trucks

Balance Type Stake Trucks

Balance Type Rack Trucks

Wagon Type Trucks

Trailer Trucks

Truck Casters and Parts

Rubber Tired and Metal Wheels

Nutting

Makes Over 1000 Standard and Special Truck Designs *for Every Purpose*

In many businesses, the handling of materials has grown on a "hap-hazard" basis, as the business has grown. If this is true in your case, you will be surprised at how much your whole production program can be speeded up—and your handling costs reduced—by a properly engineered materials handling system and selection of trucks exactly suited to each type of work. More than 1,000 truck designs have been developed in the Nutting line because they were needed.

CALL IN A NUTTING SALES ENGINEER—let him, backed by the Nutting factory, help you select the right truck for each job. Consult the classified section of your phone directory, or write us direct.

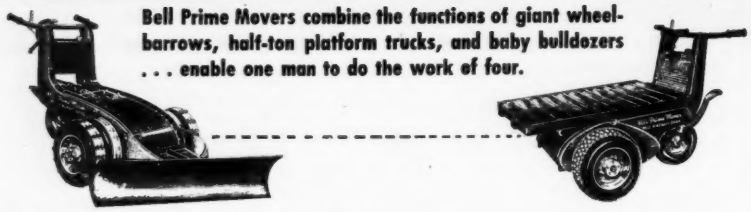
NUTTING TRUCK & CASTER COMPANY

our **57** *th Year*

1602 DIVISION STREET WEST, FARIBAULT, MINNESOTA

It saves up to $36 daily

The BELL Prime Mover*



Bell Prime Movers combine the functions of giant wheelbarrows, half-ton platform trucks, and baby bulldozers . . . enable one man to do the work of four.

● Here are just a few examples of how Bell Prime Movers pay for themselves in an amazingly short time. If other companies can make these savings, so can *your* company . . .

A Pittsburgh steel manufacturer reports daily savings of 3 to 4 man-days per machine hauling residue from blast-furnace cleaning; pouring concrete foundations; carrying ore to open hearths.

A large cemetery, with numerous 25% grades, saves 3 to 4 man-days per machine each day on wheelbarrow labor . . . removing surplus dirt, back filling, removing flowers, hauling matting; moving tools, tile, markers; pouring concrete foundations.

Many contractors report savings up to $36 per machine each day on concrete pouring, "mucking", clean-up work. They acclaim Prime Movers for work on upper floors, for climbing steep ramps, for taking the abuse of continuous rough service.

We have hundreds of case histories covering almost every type of business. We'll gladly provide you with these additional facts as well as the names of nearby distributors who sell and service the Prime Mover.

A Few Features

- bucket holds 10 cubic feet . . . 18 with sideboards
- 50-inch scraper blade
- 9-square-foot platform body
- gear driven . . . no belts or chains
- clutch, engine, transmission fully enclosed . . . run in oil

A PRODUCT OF

BELL Aircraft CORPORATION

BELL AIRCRAFT CORPORATION
Post Office Box IL-10, Buffalo 5, N. Y.

Please send me additional facts about the Bell Prime Mover.

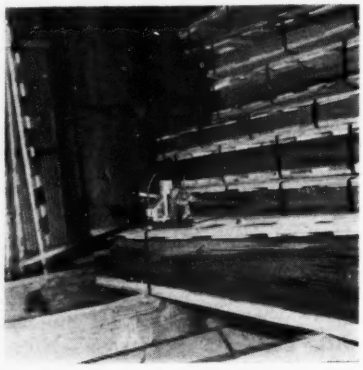
Name .....

Company .....

Address ..... *City, Zone, and State* .....

★ Patents and T. M. Reg. Pending.
Copyright, 1948

supported. As can be seen from one of the photos, all flitches are readily accessible, and fork truck handling precludes any strenuous effort. The heaviest flitches are stored to a height of 12 feet (to the bottom of the load).



Steel strapping is used to band crates together. Strapping replaces four-sided boxing.

Although the present warehouse will store approximately 50% as much veneer as the conventional end storage methods, it is planned in the future to utilize some of the space above the present box struts. This will necessitate the use of a lift truck with a higher lift than the one used at present. This further improvement is expected to make a warehouse of this type equal in capacity to the conventional warehouse.

Veneer placed on skids after removal from the dryer, is taken to warehouse by fork lift truck.

Fast, Easy Loading

When a shipment is to be made, the office makes up a form, which shows all flitch numbers and their locations enabling the warehouse operator to locate each crate quickly. After he has accumulated three or four bundles, he trucks them to the loading platform.

If the shipment is to be made by

boxcar, the loading operation is speeded by using a special freight car loader (see photo). The loader is essentially a traveling crane, and is used in conjunction with any hoist. Rails are mounted inside the boxcar by the millwright. The loader is designed to adjust to any size car by use of movable shafts which hold the double-flanged wheels. If the inside of the individual car is not uniform in width (if it is bowed out because of heavy loads), the machine will automatically adjust its length to take care of these variations.

The small hoists hang by means of a hook on the top tram of the carloader. The lift truck places the crates on the loading dock within reach of the cables of the hoists. Special hooks on the ends of the cables fasten around the sides of the crate and lift it into the boxcar. As soon as the crate is inside, it can be moved as far as desired

This freight car loader places crates inside a box car. Small hoist is used.

by pushing on the crate. The hoist lifts the crate and lowers it to the proper position. The extreme ends of the car are loaded first. The two and a half feet in the top of the car near the center occupied by the carloader may be filled by hand if necessary to completely load the car. It is estimated that the use of the carloader reduces the loading time for a car of veneer by half.

These are the highlights of the Dean Co.'s "veneer warehouse of tomorrow". Through proper layout planning and consideration of modern handling methods, a simple and effective one-man operation was developed. Heavy physical tasks have been eliminated; stock control has been simplified; crating costs have been reduced, and present crates weigh less. With realization of the plan to utilize the space above the box struts, these advantages will be enhanced through full utilization of the available space.

CLARK

PROPHETS OF PROFIT (In Seven Reels)

Facts—not phantasy—about modern materials handling methods and machines, presented in movies for consideration at *your* convenience.

How *costs*—handling costs, production costs—perennial "villains" in commerce and in industry, are meeting their master is demonstrated in seven separate "movies."

See them—in your own office, comfortably, with your own production staff; absorb the prophetic promise of profits to your business implicit in the factual film stories of how Clark fork trucks and towing tractors benefit other businesses.

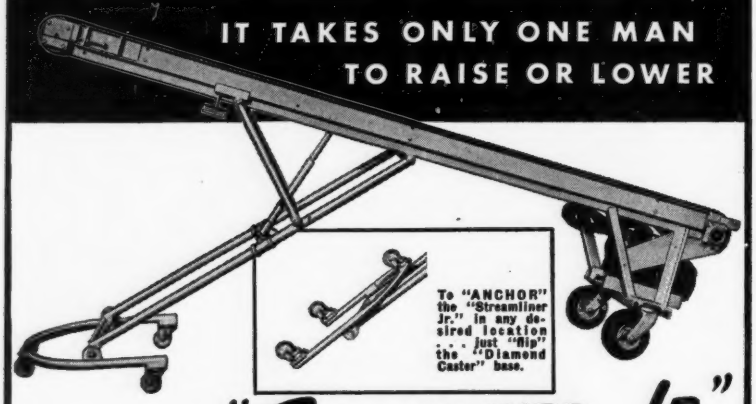
Clark offers these "Movies" on a loan basis. Tell us the salient facts about your operations so that we can judge intelligently which films will be most valuable to you. Please send requests for films to the address given below.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT COMPANY BATTLE CREEK 13, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

"THE NATIONAL GUARD DEFENDS AMERICA—JOIN NOW"

IT TAKES ONLY ONE MAN TO RAISE OR LOWER



THE NEW "STREAMLINER JR."

PORTABLE BELT BOOSTER

An hydraulic hoist—an exclusive feature conveniently located and easily operated by one man—quickly lifts or lowers the unit as needed . . . saves manpower . . . speeds materials handling. The *"Streamliner Jr."* is of sturdy welded construction . . . has "Diamond Casters" for maximum mobility . . . can be "anchored" in any desired position by simply "flipping" the caster base. Positive locking of the booster bed prevents "slip-back." For full details, write

HARRY J. FERGUSON COMPANY

WHEEL • PORTABLE BELT • BELT AND ROLLER GRAVITY CONVEYORS

121 WEST AVENUE, JENKINTOWN, PENNA.

Institute Chapter and Association Activities

THE directors of the Material Handling Society of Philadelphia recently invited the president of the Material Handling Institute and the secretary to meet with them to discuss the activities of the Institute and its chapter program. The meeting, according to word received from the national group, proved to be a very constructive one. The Philadelphia society will consider at one of their early meetings the subject of affiliating with the Material Handling Institute chapter activities.

THE committee handling the proposed New England Material Handling Show has decided to postpone the event because it falls

(Turn to page 68)

AMAZING LIGHTNESS

MAGCOA DOCKBOARDS

...made of Magnesium

MAGCOA Dockboards made of magnesium, the "miracle metal", can be handled by one man without the aid of truck, chain or hoist. They weigh less than a third as much as steel boards of comparable size and strength, and are reinforced like a bridge to carry extremely heavy loads. Their lighter weight speeds up loading and unloading operations . . . cuts down danger of hernia and mashed feet or hands. Non-sparking magnesium eliminates explosion hazard, too. Every MAGCOA Dockboard is designed to the particular requirements of your docks. Write us for further information.

If lightweight magnesium is applicable to any of your products, our facilities warrant your serious consideration.

Our Materials Handling Line Includes MAGCOA Hand Trucks, Barrel Skids and Grain Shovels *Made of Magnesium*

MAGNESIUM COMPANY OF AMERICA

EAST CHICAGO, INDIANA

EASTERN DIVISION—30 Rockefeller Plaza, New York 20, N. Y.
WESTERN DIVISION—831 S. Flower Street, Los Angeles 14, Calif.

SKILLED PERFORMANCE

with BALANCED DRIVE!

HANSEN TACKERS

SIMPLER . . .

to fasten merchandise to cards to assemble cartons, seal bags, etc., using Hansen Tackers and Staplers.

SIMPLER . . .

to operate: drives tacks one-hand as fast as you can squeeze handle. Holds scores of tacks at one loading.

SIMPLER . . .

to get more efficient shipping room and assembly line operation by using durable Hansens to speed the job. Investigate today.

ASK FOR FOLDER

A. L. HANSEN MFG. CO.
5010 RAVENSWOOD AVE CHICAGO 40 ILL.

LANHAM FOR LIFETIME

RE-NU TOP ROLLAWAY SKIDS

AND 2-WHEEL JACKS

8" WHEELS STEEL, RUBBER OR FLOR-SAVR ROLLER BEARING

2500 LB. CAP. & UP
HEAT TREATED AXLES AND CONNECTING PINS.
BOLTED & WELDED DESIGN.
MERELY REMOVE BOLTS TO REPLACE DECK BOARDS.

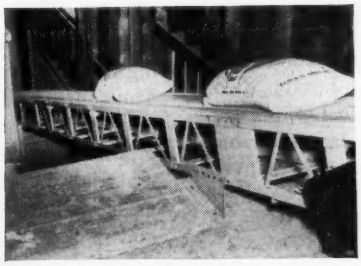
LANHAM
TWELFTH AND MAGNOLIA STS.
LOUISVILLE 10, KENTUCKY

"... keeps costs down ... frees men for other work ... speeds handling ..." say FARQUHAR CONVEYOR users

SATISFIED users report remarkable savings after they have "Conveyorized" their handling operations with Farquhar. Here are just a few examples:

At a New York pier, nine men formerly were needed to unload fresh vegetables. With Farquhar Freight Conveyors on the job, seven of the nine were freed for other work . . . handling costs were cut 50% . . . *delivery speed went up 100%.*

A large paper mill installed a series of eight Model 346 Farquhar Conveyors at a cost of $15,000 to speed up handling of coal from cars to pulverizing plant . . . and now saves between $25,000 and $30,000 yearly on trucking charges alone.



CUTS MAN-HOURS FROM 32 TO 4 *with Model 431 Farquhar Freight Conveyor (54 feet long, 18 in. belt) unloading cars in hay, grain and feed warehouse. Operation that previously took 4 men one day, now takes one man ½ day, with Farquhar Conveyor help.*

A merchant reports his Farquhar Freight Conveyor delivers crates *faster* from trucks to a second floor cleaning room at half the cost of an elevator—and handles twice as many crates.

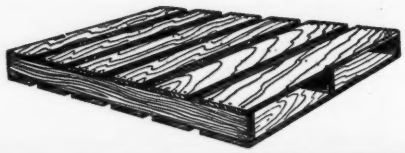
Hundreds of similar stories from laundries, food processors, grain and feed mills, chemical and paper plants, contractors, warehouses, echo *more man-hours saved . . . handling speeded up . . . over-all costs reduced* with Farquhar Conveyors.

Whether you stack, pile, load, unload, or move materials from floor to floor . . . whether it's bags, bales, boxes, cartons, bundles, any kind of packaged or bulk materials—Farquhar has the right materials handling conveyor to do your job *faster, better, cheaper.* Tell us your handling problem; we'll give you the information you need.

Write for information to A. B. Farquhar Co., *Conveyor Division,* 206 Duke St., York, Pa., or 616 W. Elm St., Chicago 10, Ill.

Farquhar
PORTABLE OR PERMANENT MATERIALS HANDLING
CONVEYORS

HYDRAULIC PRESSES • FARM EQUIPMENT • FOOD PROCESSING AND SPECIAL MACHINERY

ON THE  PALLET

NEWS · VIEWS · TRENDS

With this issue, FLOW begins its fourth year—another year of interesting and at times exciting coverage of the material handling field. It has been abundantly evident in industry, commerce, and shipping that often the difference between a profitable or losing operation lies in the solution of the problems of material flow.

FLOW was the first magazine in this field, and we feel it has accomplished a major reason for its existence—the identification of the material handling field as an industry in its own right. We are happy and proud to be members of this industry and we pledge our combined personal efforts and interests in the further dissemination of information which will be of value to all our readers and to our advertisers. We thank again all those people who have been so gracious in the job we have done. We don't propose to rest on our oars, and plans for next year are more ambitious and more exciting than ever before. We want to make FLOW better than ever.

THE 30th National Metal Exposition and Congress will be held in Convention Hall and the Commercial Museum, Philadelphia, October 25 through 29. The Exposition is sponsored by the American Society for Metals and the American Welding Society. Included among the exhibitors are: Acme Steel Co.; Alvey-Ferguson Co.; American Brass Co.; Audubon Wire Cloth Corp.; Cambridge Wire Cloth Co.; B. F. Goodrich Co.; Harnischfeger Corp.; Industrial Publishing Co., publishers of FLOW, Applied Hydraulics, Die Castings, and Industry and Welding; Production Machine Co.; Shell Oil Co.; Sun Oil Co.; The Timken Roller Bearing Co.; Westinghouse Electric Corp.; Whiting Corp.; Yale & Towne Mfg. Co.; and the Motor Generator Co.

DON G. SAVAGE, vice president and general sales manager of the Thew Shovel Co., Lorain, died recently of a heart attack at his home in Lorain. He was 50 years old. Death came only 10 days after his elevation to the vice presidency of the power shovel and crane manufacturing firm. Savage, who was also a member of the company's board of directors, had been with the company for 28 years.

WHEN "Joan of Arc" opens at theatres throughout the country in a few months, the men in the cast will be clanking about in armor patterned after the "new look", 1429 style. But because the armor is made of lightweight magnesium, these suits will weigh only 30% of the poundage endured by knights wearing iron armor, which weighed over 100 pounds. The stage armor weighs but 18 lbs., with an additional 12 pounds of chain mail. In addition to being considerably lighter to wear, the modern-ancient armor permits sitting, kneeling and walking, all of which were done with exceeding difficulty by the knights of old. Magnesium is certainly getting around.

ARTHUR J. SEILER and Joseph M. Baxter have acquired all of the stock of the Main Belting Co. of Philadelphia. The company was founded in 1881 and is one of the largest producers of various types of conveyor and transmission belting. Seiler was elected president of the company and Baxter was named vice-president and treasurer. Seiler is at present vice-president of the Phosphor Bronze Corp. of Philadelphia, and prior to that was president of York Oil Burner Co. Baxter is a certified public accountant formerly associated with Haskins and Sells, and is now secretary and treasurer of the Phosphor Co.

FOOD Machinery Corp. announced its entry into the dry packaging machinery field through the acquisition of Stokes and Smith Co. of Philadelphia. Stokes and Smith are manufacturers of a well established line of machines for the dry products packaging trade and the set-up paper box making industry. Through its acquisition, Food Machinery Corp. will be in a position to establish the S & S dry packaging equipment and set-up paper box machinery as companion equipment for FMC's food canning and packing equipment.

THE Graduate Division of New York University College of Engineering will inaugurate a new course in Material Handling and Storekeeping, according to an announcement by Dean Thorndike Saville. The course will cover the role of material handling in modern industry. Also included in the studies will be problems of procurement, movement and storage of materials between companies, work simplification in material handling, equipment for material handling, and systems for material control.

THE 12th Annual National Time and Motion Study Clinic, sponsored by the research division of the Industrial Management Society, will be held November 4th and 5th at the Sheraton Hotel, Chicago. General chairman of the Clinic is Ralph H. Landes.

Saves 750 lbs. dunnage per car

Water heater company cuts freight costs, reduces damage claims, saves time and labor with Acme Steelstrap

The extra expense of material and labor for bracing a car with heavy, costly lumber is a cost of distribution which can be reduced. Also, that hidden cost, "claims for damages," can be eliminated.

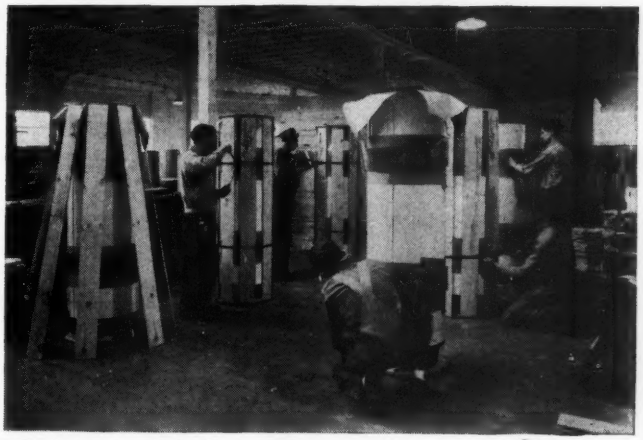
The Fowler Manufacturing Co. of Oregon asked Acme shipping specialists if Acme Unit-Load Band might be an answer to their water heater shipping problems. It was. This method saves 750 lbs. of lumber dunnage per carload and has proved to be a safer method of bracing cars.

While there, the Acme experts also suggested an improved design for individual heater packages. This resulted in another 25% savings.

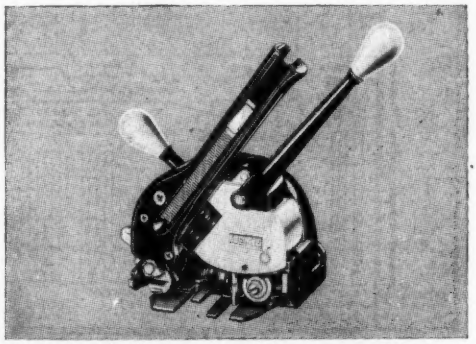
You are welcome to call in an Acme shipping specialist to consult with your organization on any shipping problem without obligation.

Write or send for booklet containing actual case histories of substantial savings made by Acme shipping specialists.

Acme Unit-Load Band practically eliminated freight damage claims, reduced labor costs, and saved 750 lbs. of lumber dunnage per carload.



A shipping room production line is building more efficient packages with Acme Steelstrap. This saves 25% on each water heater package.



More savings ahead for Acme Steelstrap users—No. 3 Steelstrapper, the lightest tool made, is now available. Magazine holds 100 seals. Tensions, seals, and cuts the strap in one operation. Small base requires only 5-inch strapping surface. Two levers working in opposite directions make for better balance and easier handling.

Acme Steelstrap

NEW YORK 17 ATLANTA CHICAGO 8 LOS ANGELES 11

Acme Steel Company, Dept. F-108
2838 Archer Avenue
Chicago 8, Illinois

Gentlemen:

Please send me a copy of your case history booklet, "SAVINGS IN SHIPPING."

Name .....

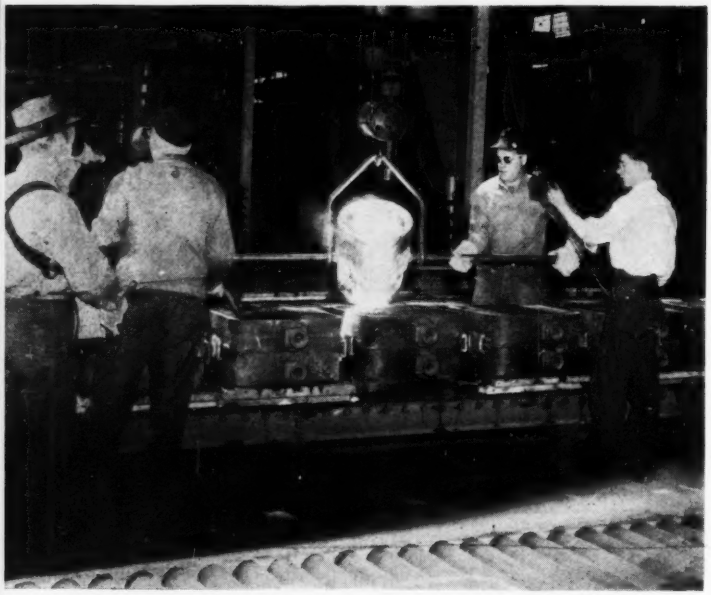
Company .....

Address .....

City..... State.....

MECHANIZE
jobb

Mechanization is nearly
ticable in this new alloy job
handling tasks mechanized,
vote their full skills t

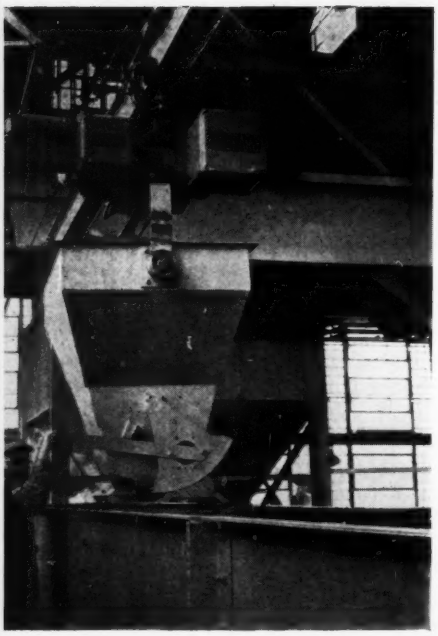


POWERED BRIDGE HOISTS traveling on monorails carry pouring ladles over palletized molds which move on gravity rollers towards shakeouts.

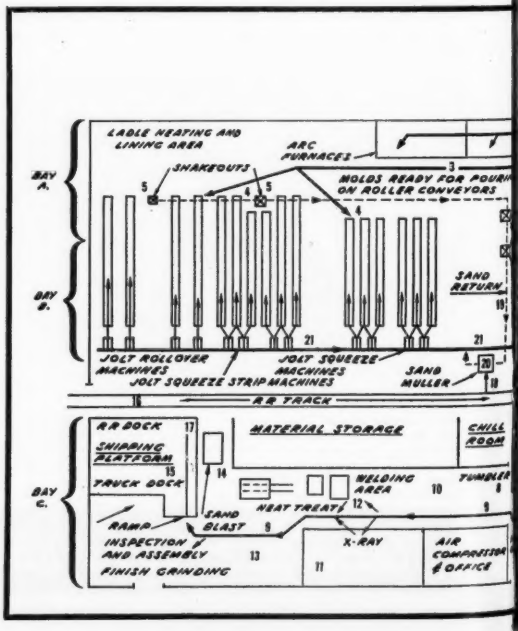
JIB HOISTS, CRANES, SHOP BOXES
FORK TRUCKS, SCOOP TRUCKS, SCALES

AMERICAN Brake Shoe Co. concentrated the activities of its Electro-Alloys Division when it opened a new $3,000,000 plant in Elyria, O., last fall. Designed by the company's engineers, the plant is reportedly the most modern high alloy jobbing foundry in the world.

The facility makes an amazing assortment of parts which go into other manufacturers' products or their plant operating equipment. Its castings range in size from slightly over an ounce to more than four tons. Large and small special analysis melts must be prepared,



MONORAIL MOUNTED power hoist is used to move hopper between sand mill and bins over core makers' stations. Hoist controlled by pendant.



Flow sheet indicates operating areas and fixed handling devices.

ZED
obbing foundry

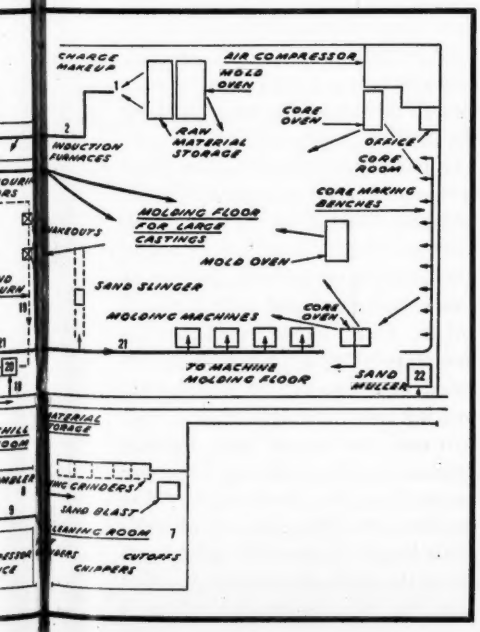
is as nearly complete as prac-
new alloy jobbing foundry. With
mechanized, operators can de-
r fu skills to production.

3-TON JIB HOIST, mounted on pedestal, handles cores and patterns in large core making department.

according to the user's requirements, for heat, abrasion and corrosion resistance. This type of specialized operation entails a great deal of handling—of materials, of supplies, and of equipment. In order to keep time and travel involved in these handlings to a minimum, the designers laid out the operations to combine the use of modern equipment with short moves. For example, melting furnaces and molding sand muller serving two principal bays are located in the approximate longitudinal center of the building, thus keeping distances to the most remote points as short as possible.

The one-floor structure has 128,800 square feet within its 280′ x 460′ dimensions. All construction is of steel and brick with generous use of glass block. The roof is monitor type covered with pre-cast concrete slabs. Among the striking features of the building are the even diffusion of light to all parts of the floor and general cleanliness of working areas created by strategically located dust trapping equipment.

The building is divided longitudinally into two adjoining main bays, housing production departments, an "in-between" low bay area through which the railroad siding runs, and a third main bay where finishing, inspection and shipping operations are conducted. (See the floor plan.) The core department is located in the south end of the two main bays.



PNEUMATIC TIRED scoop truck is used for unloading sand and alloys from box cars. Adjustable dock board is used.

Receiving By Truck and Rail

Raw materials are delivered either by truck or rail, depending on their character, quantity and source of supply. Railroad cars enter the building at its north end and are spotted at a dock immediately inside the plant, at the molding sand mill in the center, or the core sand mill at the south end. The siding continues south out of the building to service the heating plant housed in a separate structure.

Ferro alloys shipments delivered by rail are unloaded by a powered scoop truck. It operates over a concrete ramp to and from the car-level dock. The vehicle carries its load from the car to charge make-up department in a low bay area east of

Announcing

THE NEW Hertner

CHARG-O-MATIC

for

BATTERY-POWERED ELECTRIC TRUCKS

Single or Multiple Circuit Charging

• The CHARG-O-MATIC is an entirely new Hertner model, designed to provide unequalled battery charging performance, high in efficiency and low in operating and maintenance costs.

✓ CHECK THESE CHARG-O-MATIC FEATURES:

MOTOR GENERATOR: Mounted in horizontal position. Operates at safe, slow speed of 1750 R.P.M. High quality, over-size, sturdy, long life.

EXIDE TVR RELAY: Precision temperature-compensated voltage relay as standard equipment.

PILOT LIGHT: Indicates when set is in charging period.

TIME CLOCK SWITCH: Adjustable for longer or shorter charge.

HEAVY-GAUGE REINFORCED STEEL CABINET, with welded steel frame.

PACKAGED UNIT: Nothing else to buy.

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Bay A, where the material is dumped into bins. Alloys and steel arriving by truck enter the make-up department by a door in the east wall. The material is usually in drums or skid bins and unloading is accomplished by means of fork trucks or a floor-operated four-ton bridge crane which serves the area.

Sand is unloaded from rail cars by use of the bulk carrier in the same manner as the alloys when it is impractical to spot the car over a sand hopper next to the respective mill. When the car is spotted at the muller, sand is unloaded directly into the floor hopper. From the hopper, the sand is carried to storage bins over the mills by bucket elevators. Sand storage is also provided in bins along the railroad track. Unloading to these bins is facilitated by means of a portable 11-inch cleated belt conveyor. One end of the unit is inserted into the box car and the other end into the bin.

Many Handlings—One Casting

Since the plant produces an amazing assortment of castings, typical operations will be discussed in filling "special", or one item, and "production", or more than one item, orders.

A retort for a heat treating furnace can be used as an example in the single item category. This item may range in weight from 500 to 6000 pounds; length, 10 to 15 feet, and diameter, five inches to four feet. The first operation in making the casting is producing the core. The pattern for the core, the green core, and the cured core are fragile materials and must be handled with extreme care. To facilitate handling during these operations, the Bay A core area is equipped with three jib hoists. One hoist, a three-ton model, is installed on a pedestal located near the center of the core making area. The two other hoists, two and one-ton capacity models, operate on jibs radiating from columns along the west edge of the department. The jibs are of sufficient length to provide hoist service to the entire floor area. In addition, the department can call upon

the two 60-foot bridge cranes which serve Bay A. One of the cranes has a capacity of 15 tons with an eight-ton auxiliary hook while the other is an eight-ton single-hook crane.

Any of the hoists or cranes can be used to place green cores on special rack trucks which operate on tracks in and out of the baking ovens. After baking, the finished cores are removed by the hoists and set in the drag section of the flask. The bridge crane then completes the mold by applying the cope section and it is ready for pouring.

Some retorts are poured in a vertical position. For this purpose, a large pit, 10 feet deep, is provided in the bay floor. The bridge crane, with auxiliary hook, upsets the mold and gently places it into the pit.

"Orange Peel" Buckets

While the core making and molding operations are underway in their respective departments, the special analysis melts are being prepared. Following the laboratory's instructions, the charges are made up for the day's schedule. This is done in the charge make-up department in the low east bay. Alloys are taken from the storage bins and placed in trunnion-equipped skid boxes. These boxes are moved by hoist or lift truck to built-in floor scales installed beside a powered charge-making truck. When the desired amount of an ingredient is reached, the contents are dumped into the truck's hopper. After the charge is complete, the truck moves on rails and straddles a charging bucket pit in the floor of Bay A. Operated by push buttons, the truck discharges its load into the desired bucket in the pit and returns to the charge make-up department.

The loaded charging bucket is then picked up by one of the bridge cranes and moved to the electric furnace department just north of the pit. The buckets have "orange-peel" type bottoms with the sections tied together by rope. When the bucket is lowered into the hot furnace, the rope is burned away within a few seconds. As the crane

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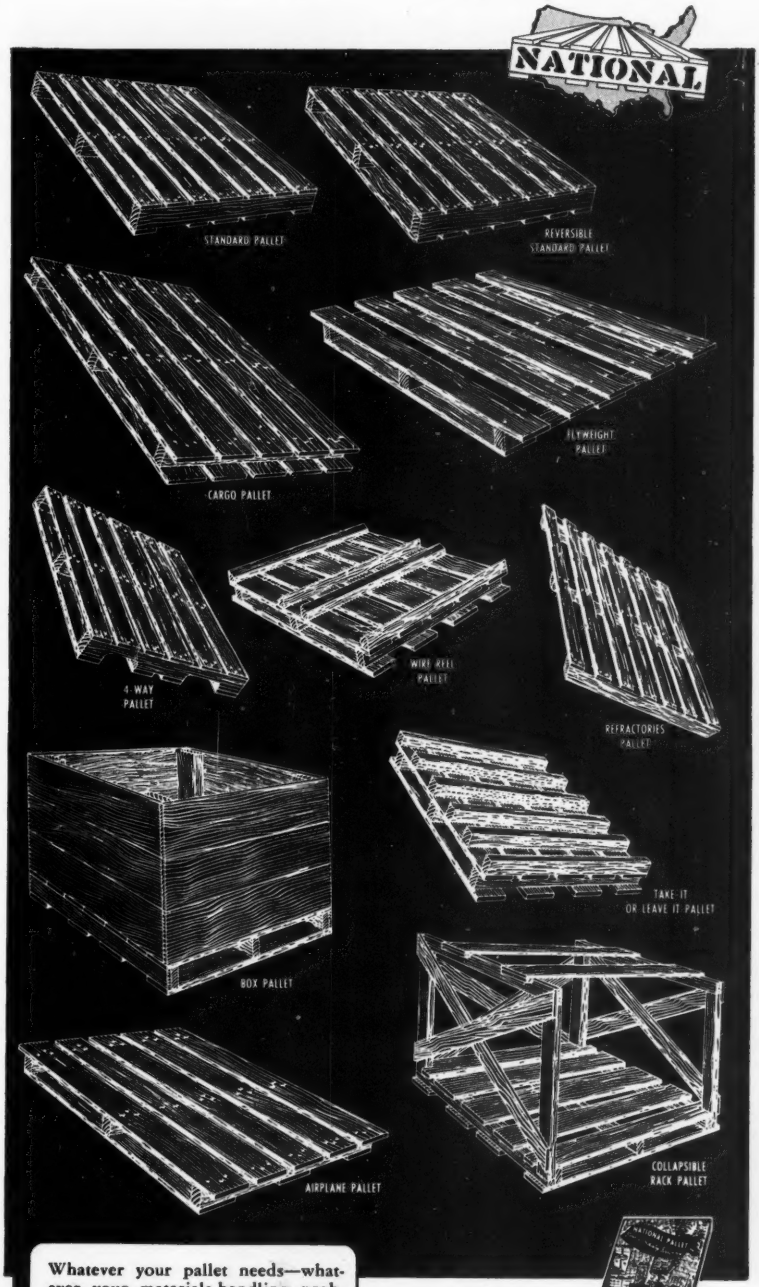

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withdraws the bucket from the top of the furnace, the "orange-peel" sections separate and the charge is left in the furnace. Before it is returned to the pit, the bucket is placed on a rack for re-tying of the bottom sections. Meanwhile, the melt has been started.

Charges needed for the day's operations are made up regardless of available furnace capacity. These charges are assembled in skid bins and moved by fork truck for temporary storage near the bucket pit.

When the melt is ready, a supply ladle holding up to 10 tons is moved by bridge crane to a position under the lip of the furnace to receive the molten material. The full bull ladle is moved to the casting area where it pours large castings or supplies a small pouring ladle suspended from the other bridge crane.

When the casting has cooled, the bridge crane picks the mold out of the pit and places it on a mechanized shake-out adjacent to the pit. Sand falls through the grill to a conveyor for return to the sand mill for reconditioning. The casting is placed on powered flange-wheeled transfer truck or powered fork truck for removal to the sandblasting, finishing and inspection departments. Flasks are stacked by crane on one side of the bay until needed again.

Fewer Handlings Per Unit

In contrast with the operation just described, handlings per single unit are reduced in the production casting department, located in Bay B, since many items can be cast in a "gang" mold with a single pouring. Operations begin in the core department at the south end of the bay. Core makers' benches and machines are located along the south wall. Thousands of small cores are produced every day with equipment located for economy of movement by operators. Sand is delivered by a hopper moving on a monorail hoist between the sand mill, at the west end of the trackage, and the chutes over each station. The sand mill operator accompanies the hoist and hopper on each trip, walking on a catwalk above the chutes. He controls the travel of the hoist by push buttons on a cable pendulum.

BUILT-IN FLOOR SCALES weigh ingredients in Charge Makeup Department. Note that bins are equipped with trunnions for hoist handling and angle iron bottom rails for fork truck handling.

Green cores are placed by the operators on sheet iron racks which are moved by hand platform trucks to special flanged wheel dollies moving in and out the baking oven.

Just north of the baking oven and core department is an area known as the medium production casting department. Here are produced castings such as large cyanide pots weighing several hundred pounds each. Molds are made with floor jolt machines. The flasks and patterns are placed into position by any of the five two-ton capacity jib hoists serving the area in addition to two overhead bridge cranes, each with a capacity of eight tons.

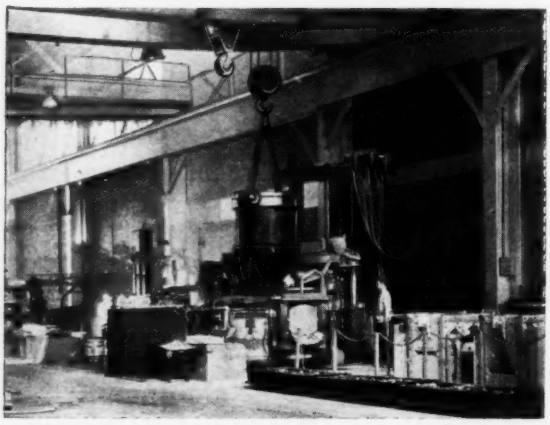
Sand for these molding operations is obtained either by chute directly from the main overhead distributing belt, which runs for 400 feet along the west side of the bay, or a powered sand slinger which operates on rails from the belt eastward across this bay and into Bay A. By this arrangement, the slinger takes its supply of sand directly from a chute in the main sand line.

Certain types of core making are also done here and sand is brought to the operators in tote boxes by powered fork trucks.

Machine molding operations are performed in the north half of this bay. The squeezer machines are located along the west side directly under the sand chutes. The chutes are equipped with pneumatic vibrators for efficient sand service. Fragile cores are delivered to the molders on balance-type pneumatic tired carts.

Roller conveyors extend from the machines across the entire width of

CHARGING ELECTRIC FURNACE. "Orange-peel" bucket holding charge is suspended from 8-ton auxiliary hook of one overhead crane serving Bay A. Note 15-ton hook at its left.



DROP BOTTOM TOTE BOXES of castings are delivered by fork truck in grinding department.

the bay. The lines are 12 inches off the floor and are separated by two-foot aisles. As a mold is completed, the operator sets it on a pallet and transfers it from the machine to the roller line on which it moves away toward the source of metal.

This gravity roller area is served by hand-operated and powered hoists operating on monorail trackage. Pouring ladles are supplied with molten metal from supply ladles delivered by the bridge cranes in Bay A. These pouring ladles are then moved along the monorail trackage over the molds on the roller conveyor lines.

Excellent Safety Doors

Shakeouts are located at the Bay A end of the roller lines. Operators lift the complete flasks by the monorail hoists and transfer them from the line to the shakeout grill. Castings are retrieved from the vibrator with long hooks and placed in tote boxes. Empty flask sections are placed on a return gravity roller conveyor which circles the molding area and keeps the machine molders supplied with equipment.

The tote boxes filled with castings are moved by fork truck to the finishing department for sand blasting, grinding and inspection.

The west or "C" bay which houses finishing, inspection and shipping departments is served by two bridge cranes of five-ton capacity for handling the heavier castings. Grinding and sand blasting operators have monorail hoists available at their stations.

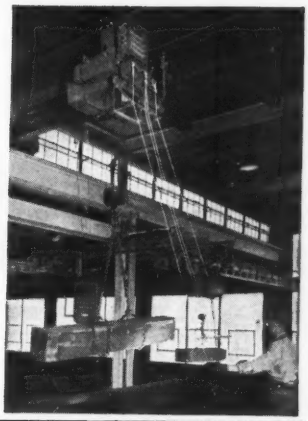
"A Steady Flow"

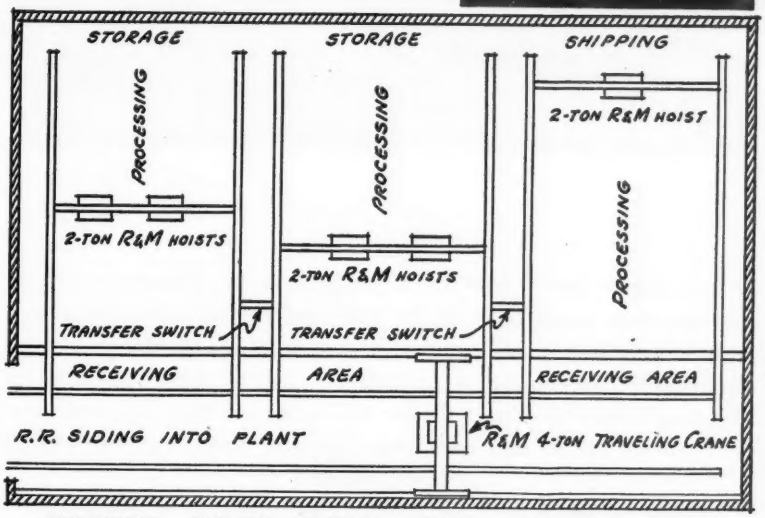
Following finishing department operations, the castings are moved toward the shipping dock at the north end of the bay. The dock is accessible on the northwest side to highway trucks at deck height and to rail cars on the east side at door height. Powered fork and platform trucks reach the dock by ramps.

A steady flow of production through the plant is maintained because: 1. Each department is

(Turn to page 75)

HOW R & M HOISTS PAY OFF!





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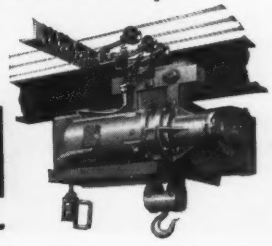
R & M'S DO *ALL* THE LIFTING HERE . . . One man, with 4-ton traveling crane, unloads steel from gondolas into receiving area. From there, five 2-ton trolley hoists on traveling bridges serve storage, processing lines and shipping. Hoists can be switched from one bridge to another as requirements vary; operators need no special skill or training. Savings in handling costs have been substantial. Congestion reduced to a minimum . . . manpower utilized to best advantage . . . operations set for *peak efficiency.*

KEEP COSTS DOWN—PROFITS UP . . . Plug leaks in *your* profits, streamline *your* materials movement. An R & M specialist will gladly analyze, make recommendations. So "Take it UP with R & M." Hoists and cranes in types and sizes for every purpose. Write *today.*

Type F1—Capacity: 1000-4000 lbs.
Others from 250-20,000 lbs.



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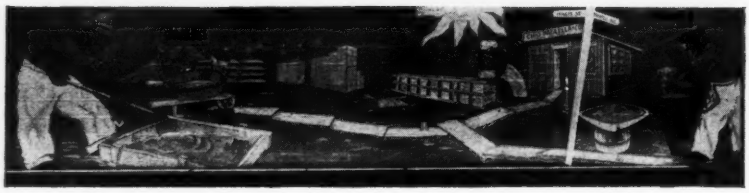
A VARIETY OF HANDLING IDEAS



The tremendous advances made in modern material handling methods are too often taken for granted. The photo at left shows block handling 25 years ago, when Plasticrete was started. The hand-mixed batches were moved by wheelbarrow to hand tamping, right, then to drying and stacking, center, background. The photo was taken of a mural in the Plasticrete conference room, where it serves as a reminder to executives of the company's progress.—Ed.

Progressive material flow from production to outbound vehicles . . . two-cycle curing process for quick release of racks and maximum kiln output . . . off-bearers with special spring steel forks for handling of two pallets at a time . . use of steel strapping in shipping specialty sizes. These are some of the efficient procedures—in layout and handling—you can observe at this cinder block plant.

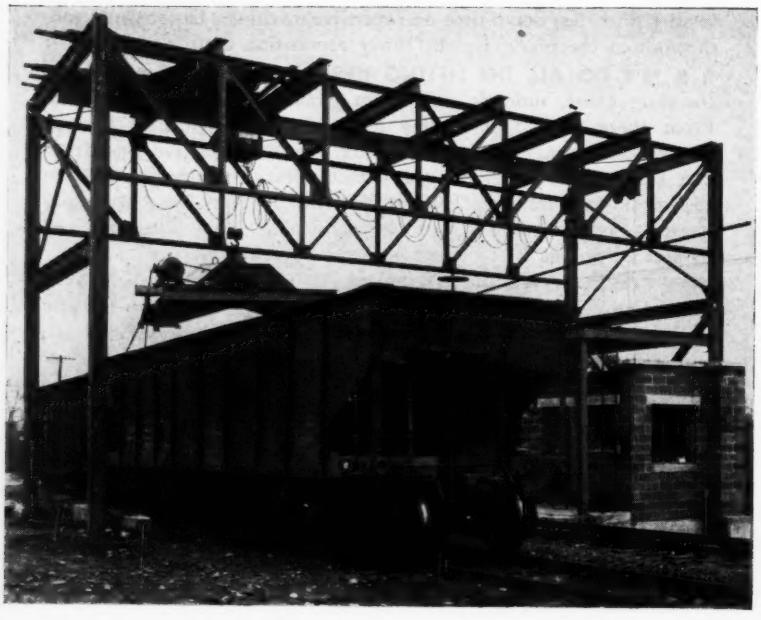
By LEO A. SCILLIA
Plant Engineer
Plasticrete Corp., Hamden, Conn.

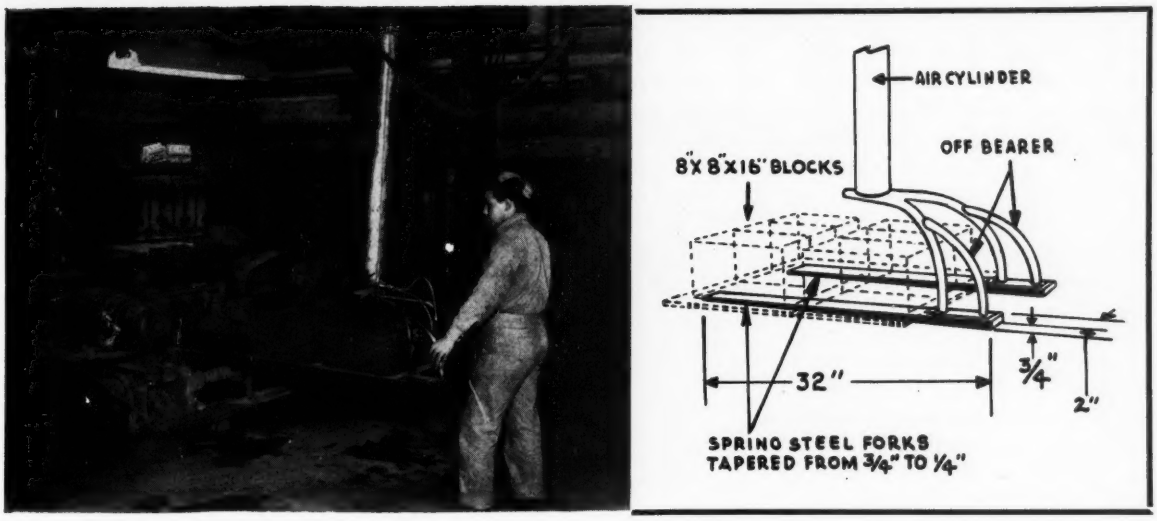
OUR production in 1946 was 9,100,000 cinder blocks. With a steadily increasing output over the past several years, we have concentrated on the "important details" in an effort to integrate our power handling operations into an efficient system.

For example, we stepped up the capacity of our block making machines from 600 to 720 blocks per machine-hour. This higher output entailed the transfer of a larger volume from the machines to the curing racks. The conventional offbearer available at the time was designed to pick up only one ¼" x 18" x 26" pallet at a time. The customary procedure was to load the far side of a rack first, then the near side.

With our higher output, we planned to remove two pallets of fresh blocks from the machines at one time and to load the full width of the curing rack, loading both sides of the racks simultaneously. Our problem was therefore to design an accessory suitable for supporting two pallets of fresh block. We developed a special fork which is made of spring steel. As shown in one of the sketches on these pages,

CINDER CAR SHAKEOUT, suspended from 12,000 lb. hoist, operates at speed of 1400 rpm.





SPECIAL OFF-BEARER has 32" fork to handle two pallets at a time. Drawing at right shows details and dimensions.

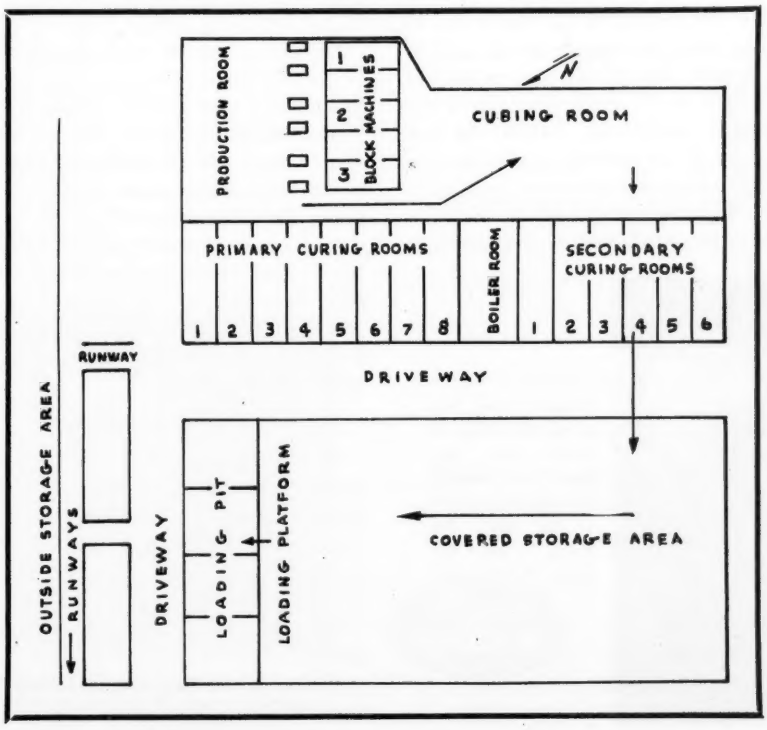
its 32-inch length is sufficient to support two pallets simultaneously. This two-tined fork is ¾" thick at the heel and tapers to ¼" at the points.

Speedier Production, Faster Handling

Our block machine operators now pick up six eight-inch blocks from the delivery ends of the machines instead of the customary three. This in turn enables them to keep up easily with the higher output. The new method aligns this part of the over-all job with the high-capacity fork truck handling operation.

A glance at the flow diagram on these pages shows that the material from the production room advances progressively through a U-shaped layout as it travels through primary curing, cubing, secondary curing, storage and shipping. Platform trucks run the loaded racks of fresh block into the primary curing rooms. Upon completion of this process, the blocks travel north to the cubing area, thence into the secondary curing rooms. In passing, note that the boiler room is located between the primary and secondary curing rooms, providing the shortest travel distance for the steam to either area. From secondary curing, the loads move across a drive-way into the covered storage area, thence in a straight line to the loading platform and the outbound vehicles.

LAYOUT SHOWS flow from production room to loading platform. Storage area at left is used for colored blocks and specialty sizes, storage at right for standard blocks.



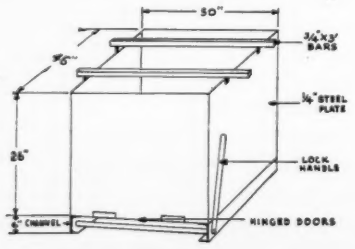
Our two-cycle curing process has aroused some interest in the industry, and it is closely related to efficient handling practice and space utilization. The complete curing cycle takes 20 hours.

The advantages are considerable. Racks and pallets are tied up for a minimum amount of time. Their quick availability has been of help to production and has meant a smaller inventory of this equipment to be carried. Maximum production is also obtained from the secondary curing kilns per cubic foot of space. Since the blocks are cubed for this process, there are no

racks to take up space. These kilns have a ceiling height of 14 feet, which permits the cubes to be stacked three high. The net of the method is that we can cure three times the amount of blocks in two thirds of the space.

Our secondary curing rooms are of the double outlet type. As the flow sheet shows, they are fed from the east end and unloaded from the west end. Upon completion of the process, the fork trucks transport the cubes across the driveway into the covered 100′ x 200′ storage area. While the material in process moves north to south, it moves south to north in the shed, completing the U-shaped flow. One cube (90 blocks) at a time is placed into the secondary curing rooms. The fork trucks usually handle two cubes at a time from the secondary curing rooms to storage.

In the storage area, the cubes are likewise stacked three high. Our company makes a two-core block, and we use a six-tined fork on our lift trucks. The bulk of the product is 8″ x 8″ x 16″ block, which has the correct openings for fork truck handling. (The six-fork tines are accommodated in the six holes of the three blocks forming the bottom layer of the cube.) Smaller sizes do not have the necessary openings for entry of the forks. Examples are 4″ x 8″ x 16″ and 3″ x 8″ x 18″ blocks. These are therefore cubed on the standard 8″ x 8″ x 16″ block as a "pallet" base.



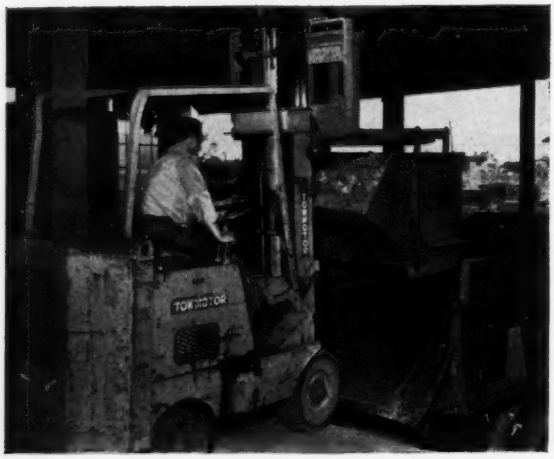
Many Details Make a System

A word about our use of steel strapping, which is shown in one of the photographs. The larger blocks—in sizes of four, six, eight and 12 inches—are not strapped because they are cubed in the customary interlocking pattern, giving the necessary stability during transportation. Because the two and three-inch blocks and the half, quarter and three-quarter blocks cannot be interlocked, we bind these pieces with steel strapping for shipment.

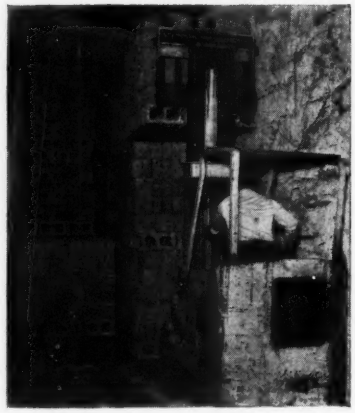
A typical strapping pattern is shown in one of the photographs. Three lengths of 5/8″ strapping are applied vertically to the load through the holes of the bottom layer forming the pallet base, one band through each block. A fourth band is then applied horizontally in order to tie the unit in this direction.

Three 5000-pound fork trucks do all the loading in the north end of the area, as shown in one of the photos. Practically the equivalent of the daily production leaves the plant every day. About 80 per cent of the volume is handled on our company's delivery vehicles.

The four-stall loading platform at the north end is depressed to bring the trailer beds on a level with the paved storage floor, permitting the fork trucks to run on the outbound vehicles. With cube handling, a trailer can be loaded with 1300 blocks in 22 minutes. In other words, a fork truck can load out 3900 blocks in a little more than an hour.



Drawing, top left, gives dimensions of useful scrap box. Photo, left, shows it in a typical operation at the plant. Box makes for quick disposal of scrap, safe handling.



MORE PRODUCTION, LESS SPACE in high-ceilinged secondary curing room. Racks are not needed in this step of cycle.

As can be seen from the flow sheet, another storage area, not covered, is located across a driveway from the loading platform. This one serves largely for colored blocks and specialty sizes which are not in the normal flow of work. These products are segregated so they won't interfere with the flow of the standard products that are handled in considerable quantity. The yard also serves for storage of winter stock, since a smaller volume moves out during that season of the year. The unpaved yard is served by a pneumatic-tired 6000-pound fork truck with a 108-inch lift. This unit of our truck fleet stacks all specialties from the curing rooms and loads them on the outbound vehicles.

A Problem to Be Solved

Paved runways have been laid down in the yard to the various locations in order to facilitate fork truck travel and hold it to a minimum. At present a covered shed is also located in the yard, and a project is planned to cover the whole area.

I have mentioned the fast loading operation of outbound vehicles.

We at Plasticrete are also concerned with the other side of the picture—the unloading of the delivery vehicles at destination. While we are satisfied with the loading time of 1300 blocks in 22 minutes, the company engineers and the traffic department feel that a similarly fast *unloading* method on the job would be highly desirable.

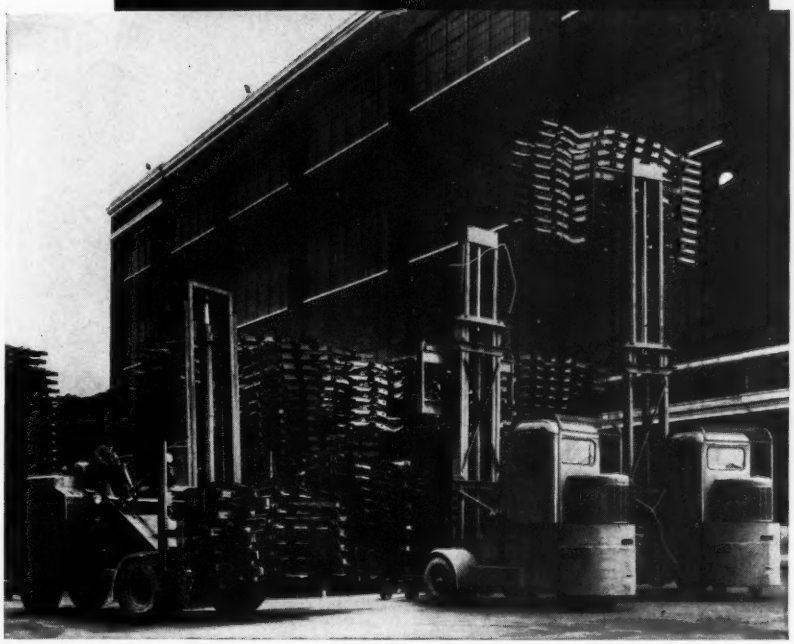
The usual procedure is for one man on the truck to feed the blocks to the edge of the vehicle, where they are taken off by hand. This method takes up to two hours per load of 1300 units. With a special platform dump-type body, which we designed for our straight trucks, a load of 700 eight-inch blocks can be dumped with less than ½ of one per cent of breakage. It would be desirable both to eliminate this breakage on our smaller vehicles and to unload our larger ones without the piece-by-piece method. With the larger loads the breakage ratio would increase because of the greater weight (1300 blocks).

We have many drawings of proposed devices, but upon close analysis they have remained in the drawing stage. The device we have in mind would have to be portable so it could be carried along on the trucks. The assumption is of course that there would be no suitable handling equipment at the unloading point. Thus the device would have to be a self-contained unit which would not materially reduce the load capacity of the vehicles by taking up any appreciable portion of the trailer beds. We are continuing to work on the idea.

(Turn to page 70)

HALF BLOCKS, cubed on standard blocks, are steel-strapped for shipments, also specials.

ROSS HEAVY DUTY LIFT TRUCKS



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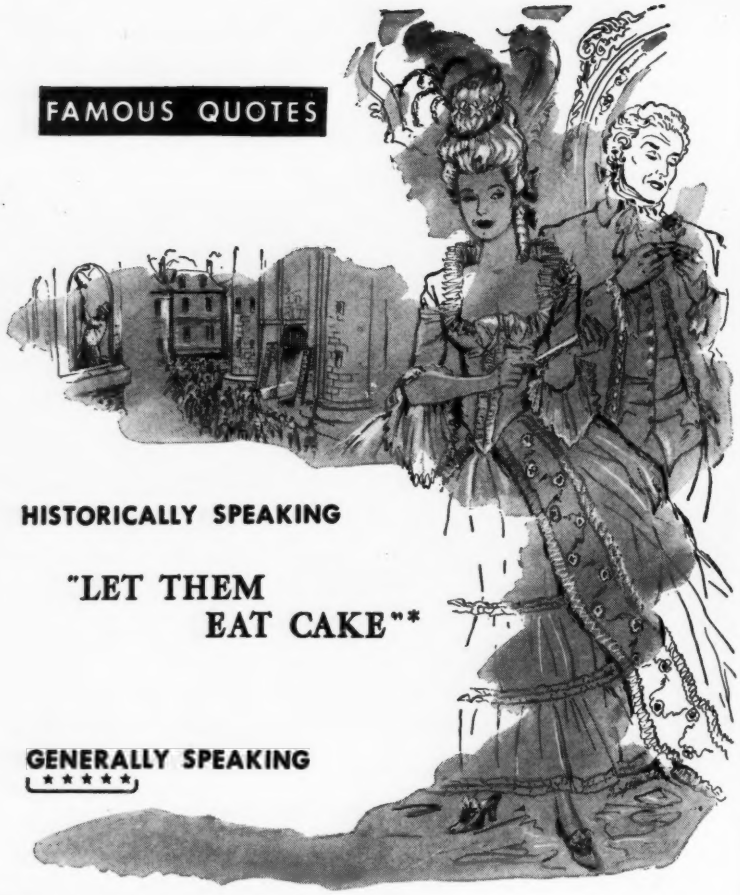

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**Marie Antoinette* (1755-1793), *Queen of France. When told that her suffering subjects had no bread, it is reported that she said: "Let them eat cake."*

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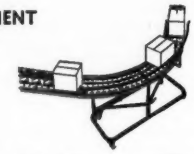

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PACKAGING MECHANICS SECTION

A regular monthly section in which are presented solutions to the problems of efficient filling and handling the boxes, cartons, bags, bottles, cases, etc., used in commerce and industry.

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QUICK CONVEYOR HANDLING For Quick-Frozen Chickens. This description covers all steps—from the crates for live chickens until the fryers leave the plant in cartons..... 54

PACKAGING *and Palatability*

In packaging its five-cent Tootsie Rolls, the Sweets Co. of America, Hoboken, designed methods for these objectives; high-speed packaging on automatic machines, minimum manipulation of the candy rolls, sanitation, continuous return of salvage material to reprocessing, engineered methods for two-handed operations and quick cartoning, accurate production counts, speedy flow of variously sized cartons through gluing and compression units.

TWO batteries of packaging machines produce the five-cent Tootsie Rolls in the wrapper that has been familiar for years. This description of operations at one battery is typical of the methods generally used.

In the south end of the packaging room, a battery of cutting machines produces the individual rolls, 4½" long and ¾" in diameter, which are delivered from each machine on a 24-inch belt. Traveling laterally to these several lines is the inspection belt which conveys the material from all cutters. Operators along this belt make a visual inspection for quality, size and shape. The gloved operators dispose of improperly shaped pieces by placing them on a belt conveyor running nine inches below the inspection line. Since the latter runs at approximately chest height, the disposal is done with minimum stooping on the part of the operators. The rejected material is returned to the central salvage system which delivers it for reprocessing to the manufacturing department. The salvage conveyor system includes flat and cleated belts as well as bucket elevators.

The 30-foot-long inspection belt delivers to the packaging feed conveyors. The latter parallel the battery of packaging machines extending from south to north along the east wall in the room. The material feed or supply conveyors consist of two belts running in opposite directions and connected at the two ends by two narrow troughed belts. On this "oval" line the Tootsie Rolls are kept circulating past the packaging machine (see photos and flow diagram).

CONVEYOR BELTS deliver from cutters to inspectors. Arrow shows (lower) salvage belt.

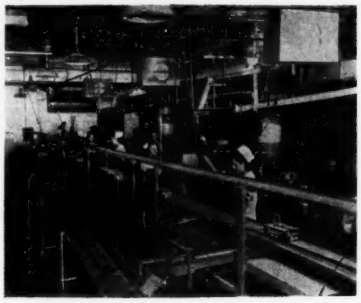
FLEXIBLE GRAVITY ROLLER SWITCH (1) delivers to gluer from seven lines. Note second switch (2) which serves three lines at one end of layout.

Graduated material flow guides are attached to the conveyor channel at one side to narrow the stream of circulating candy, thus keeping it confined on the half of the carrying surface that is closest to the packaging machine operators. This makes it unnecessary for the operators to reach out.

Other production details are noteworthy. The chain-drive feeds of the packaging machines extend at an angle over the material supply conveyor. This arrangement allows each girl to feed with both hands simultaneously, also to carry the pieces from the belt the same distance.

The method of boxing the wrapped rolls is likewise of interest. Manual handling of each wrapped roll might spoil the contour of the candy besides consuming a lot of time. Here is how this is avoided. The delivery end of each packaging machine slopes over a packer's table. The box size is designed to ac-

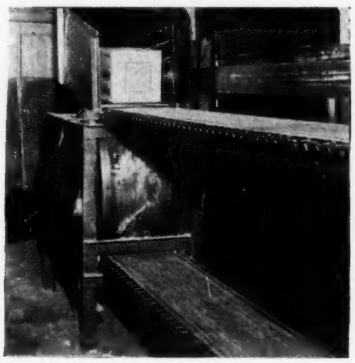
commodate three layers of eight rolls each. The operator takes a layer of eight rolls by use of a



PACKAGING LINE circulates candy past machines. Upper belt line takes out full boxes.

spatula which is just long enough for this number at one pick-up. The entire layer of eight rolls is slid into the box from the spatula, thus avoiding counting as well as manual manipulation of the individual rolls.

The full boxes are disposed of on an eight-inch belt running about 10 inches above the material supply conveyor, as shown in one of the photos. An accurate count of the units produced is important in an operation where each of several work stations along one line must receive credit for its output. This is done by means of mechanical counters, one being attached to the conveyor structure at every station. An arm extending down from the counter strokes each box passing



This is the conveyor belt powered by 36-inch pulleys. Both runs are used.

underneath. A guide just beyond each packaging machine shifts the registered boxes to the "far" side of the belt, thus eliminating the possibility of a recount on the other counters farther along the line.

(Turn to page 56)

A New Word for Material-Handling Versatility

TRACT-R-LIFT

Tract-R-Lift illustrated is 2,000-lb., gas-powered, solid-tire model.

NOW you can get into those tight corners . . . use those narrow aisles and platforms . . . load and unload trucks, trailers and freight cars—with Tract-R-Lift power and speed!

Tract-R-Lifts go through ordinary doorways with inches to spare on each side, and under any overhead with a clearance of 61"! Add modern engineering design and top quality materials throughout . . . And you have a new word for material-handling economy and versatility—TRACT-R-LIFT!

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Quick Conveyor Handling

for Quick-frozen Chickens

Scales, castered equipment, overhead chain and table conveyors, standard cartons and heat sealers. This combination helps turn a live chicken into a quick frozen packaged product in less than three hours.

OVERHEAD CONVEYOR supports shackles from which chickens are hung, background. Note castered batteries.

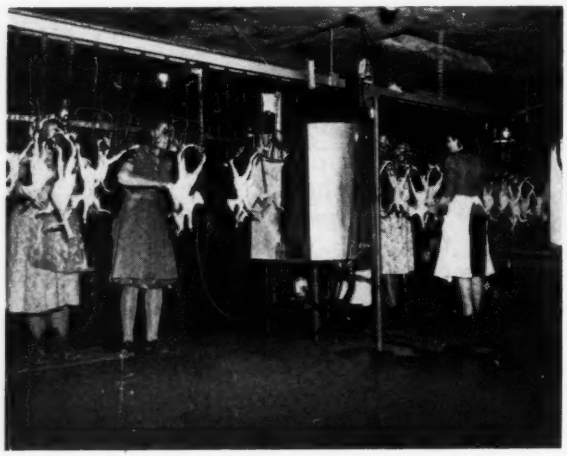
POULTRY is one of the newer additions to the frozen food industry. Located in Gainesville, Ga., J. D. Jewell, Inc., has developed methods that process 2000 birds per hour. The operations begin with live birds and end with a quick frozen product for the consumer. Seventy-five per cent of the finished product is bulk packed in large barrels, with the remaining 25 per cent packaged in cartons and quick frozen.

Control By Weight. Conveyor Movement

The chickens, which are received from the brooder houses in standard coops, are placed on semi-live skids and weighed. All production is controlled on a weight basis. The birds are then transferred into caster mounted wire cage batteries, four tiers high, with each tier divided into four sections. 160 birds are placed in each battery in the winter, 144 in the summer. Here they are fed for 24 hours to regain some of the weight lost in shipment.

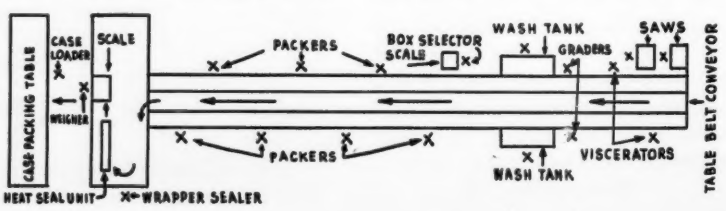
The chickens are then removed from the batteries and hung on wire shackles suspended from an overhead conveyor. These shackles hold the birds by their legs in an inverted position. There are 800 shackles spaced at six-inch centers along the 400-foot-long conveyor. Within 20 minutes after they are so placed, the chickens have been killed, semi-scalded, picked, drawn, singed, and washed. The majority of these operations are automatic. In one of the illustrations the chickens can be seen passing through a gas fired singer as they hang suspended from the conveyor.

The birds, when taken from the conveyor, are still warm. The body heat is reduced by placing them in large castered tubs filled with ice, for from one to two hours, thus



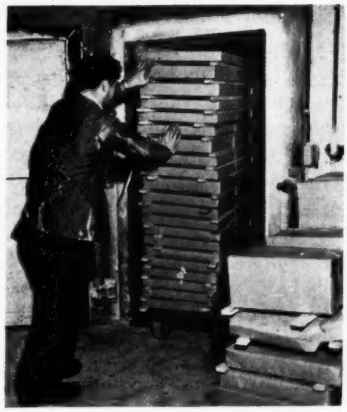
PROCESSING the birds. Note the gas fired singer through which the chickens travel.

WIRE BELT TABLE conveyor moves fowl. Stainless steel construction facilitates steam cleaning.



Flow sheet shows single direction flow. Major work stations and handling devices are indicated.

lowering their temperature to 37 degrees F. At the same time excess blood is drained off. The birds



MASTER CARTONS are trucked to 40° below zero freezer. Sticked cartons speed freezing.

for the frozen packages are then placed on porcelain trays and delivered to the packaging line. Flow is maintained on this line by means of a stainless steel table belt conveyor (see sketch). Eighteen operators are stationed along this line and process up to 500 chickens per hour.

The first operation is to saw the carcass into 10 pieces and place them on individual trays, keeping the component parts of each bird grouped for later packing. The loaded trays are placed on the conveyor and are removed farther on, where the remaining internal organs are viscerated.

Cartoning, Heat Sealing

The trays then pass to graders who inspect each piece and cull any defects. If any piece is broken or bruised, it is discarded, with those remaining used in institutional packs.

The birds continue on the conveyor to the washers, where each piece is thoroughly cleaned, and bone shavings, caused by the saws, are removed. The loaded tray is next weighed to select the proper size box for packaging. Two different cartons are used, according to the size of the bird. One for 2¼ pounds and under, the other for those weighing more. The operator matches the bird with the box and the loaded tray and carton passes

Contest Deadline Is Approaching!

FLOW'S Second Cost Analysis Contest Closes November 15, 1948.

There's plenty of time to finish the paper you started. If you have not so far written us for an entry blank, and you have material suitable for a paper, there's still time enough for you to get started at once. But all papers must be mailed not later than midnight, November 15, to qualify for the generous cash awards.

Prizes Total $1,500.

$1,500 in cash awards make up eight prizes, as follows: First prize, $500; second prize, $300; third prize, $200; and five prizes of $100 each.

The simple rules are explained on the entry blank, for which you may write us. All entries are coded, with the names removed, before being submitted to the judges. Your entry is judged solely on the basis of accuracy and completeness of cost analysis factors. Savings should be substantiated, not given in a lump sum.

If your paper is ready now, send it to us at once. This will help simplify the clerical work at closing time. The judges will be announced in an early issue.

If you haven't already done so, write for your entry blank and start your paper without delay.

FLOW MAGAZINE

1240 Ontario Street **Cleveland 13, Ohio**

on to the packers. Here an operator assembles the knocked-down carton and places a sheet of cellophane in it. Seven packers are stationed further down the line to remove the trays and custom pack each carton.

By nesting, the operators are able to pack a maximum number of pieces into a relatively small box. The packer closes the loaded carton and places it on the belt for wrapping and sealing. The carton, made of waxed solid paperboard is then given an overwrap of heavy waxed paper. A hot plate is used in this application. Each time a fold is made the operator passes it over the heat seal unit to melt the wax on the paper sufficiently to bond. The cellophane inner wrap into which the chicken is placed within the carton, is required to prevent contact of the meat with the waxed paperboard.

A Table Delicacy In Less Than Three Hours

The individually wrapped cartons are then weighed and the weight noted on them. They are then placed into master corrugated boxes, constructed to accommodate two cartons in the width and three in the length. This shallow package will freeze in a minimum of time. These boxes are placed on a chain conveyor and delivered to the freezers, where they are loaded on castered trucks for movement into the quick freeze unit. In placing the cartons on the truck, the operator sticks each layer to provide air space between cartons and promote faster freezing. The truck load remains in the 40-degree-below-zero freezer until the contents are thoroughly frozen. They are then transferred to the storage feezer, which is maintained at minus 20 degrees. The subsequent handling to the retailer is done in refrigerated carriers.

The bulk packs require merely icing, barrel packing and covering with waterproof paper, in order to assure safe shipment.

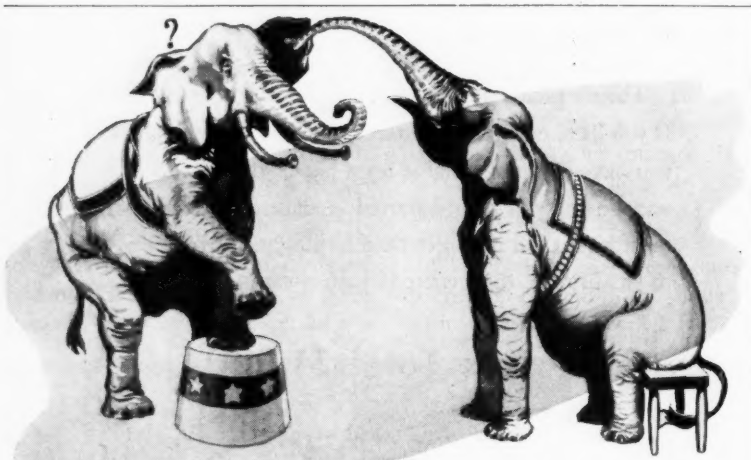
Thus, J. D. Jewell, Inc., through the methods described, is able to completely process a live bird to a frozen one, ready for the pan, in less than three hours.

TOOTSIE ROLLS . . .

(Continued from page 53)

Quality inspection continues as the Tootsie Rolls circulate past the packers. Units that have been slightly distorted or broken apart are disposed of on a belt running below the material supply conveyor. As explained in the article (this issue) on the company's manufacturing department, the instant conveyor disposal of salvage material is a distinct contribution to quality control and sanitation.

Following is a description of the operation of the packaging machines, which wrap a double waxed wrapper around each roll after it has been placed on a length of laminated cardboard. The cellophane



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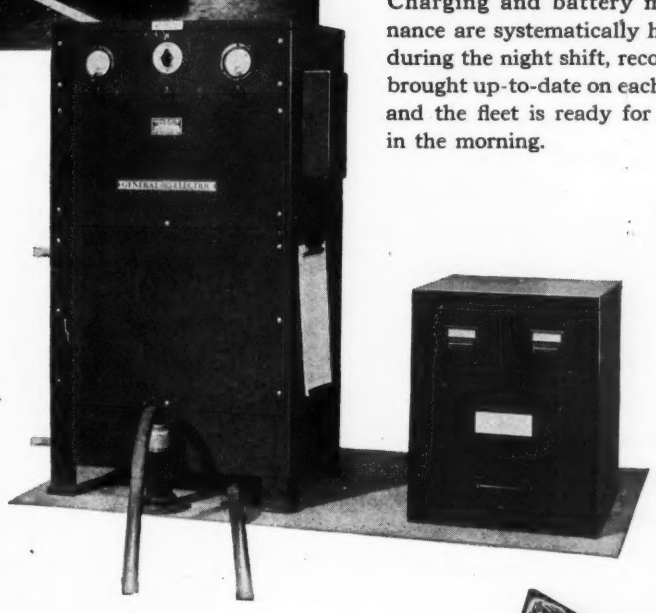
To move material fast through the 35-acre Pentagon Building, 4,500 pallets, 500 skids, and 51 trailers are handled by a fleet of 30 electric industrial trucks. To keep these trucks at peak efficiency, a well-organized charging room makes use of 30 General Electric copper-oxide rectifiers.

In this layout, each truck has its own numbered stall, equipped with a General Electric rectifier, filling hose, and record board. Charging and battery maintenance are systematically handled during the night shift, records are brought up-to-date on each truck, and the fleet is ready for its job in the morning.

RECTIFIERS FIT YOUR LAYOUT, FIT YOUR HANDLING NEEDS

Whether your setup calls for a centralized charging station like the Pentagon Building layout, or rectifiers strategically spotted on truck routes — General Electric copper-oxide rectifiers do the job the way you want it done. SMALL, they take little space—can be used right in work areas. STURDY, they give years of service, because there are no moving parts except the ball-bearing-equipped cooling fan. EFFICIENT, they operate with no noise; time the charge; shut off automatically; and disconnect both from the incoming line and the battery.

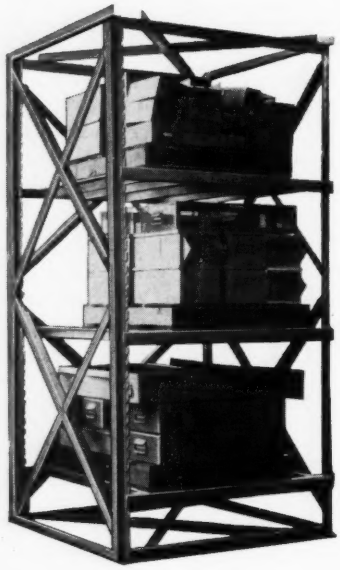


CHECK DIMENSIONS • CHECK PERFORMANCE

The booklet, *Aids to Economical, Faster Material Handling,* gives dimensions and performance characteristics on General Electric copper-oxide rectifiers. Check them with your own layout and performance demands. For your free copy, write to Section A19-1036, Construction Materials Department, General Electric Company, Bridgeport 2, Connecticut.

GENERAL ELECTRIC

UP OFF THE FLOOR



To avoid spreading bulky loads about the floor causing serious congestion problems.

Adjustable racks can handle up to six pallets in floor space of one, each automatically removable.

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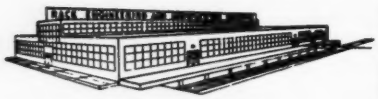

RACK
ENGINEERING COMPANY
925 LIBERTY AVE.
PITTSBURGH 22, PA.

lamination is applied to one side and prevents the candy from sticking. The cardboard, which serves as a base for the package, is cut off from a roll and the individual lengths are fed into chain-mounted pockets. The roll of candy is deposited on it and the pocket then advances under the cut-off for the lining and printed outer wrapper—each fed and cut from an individual roll—in such a manner that the lining is within the outer wrapper when the cut-off occurs. One side of the outer wrapper passes over an adhesive applicator, and the wrap is then completed around the candy.

The wrapped material is then elevated to a hot plate, where a mechanical (chain-mounted) carrier head closes over it, holding it against the electrically heated surface to set the adhesive. At the end of the 24-inch-long plate the carrier head is released, and the wrapped Tootsie Roll passes onto the conveyorized delivery. An earlier paragraph explained the eight-at-a-time removal method, also the disposal of the full boxes. The latter, incidentally, are of the accordian-fold type, designed to conserve space in storage.

The closing of the full boxes takes place at the end of the line, on a sloping section of gravity roller conveyor. The boxes from the packaging line arrive on a stainless steel plate that is clamped over the rollers. The operator places a lid over the box, then sends it on its way. Thus the unit is held momentarily to receive the box top, with the inclined line facilitating the further travel.

The completed units arrive via spiral friction chute at the packing station on the floor below. Here, on a gravity roller table, 16 boxes are loaded into a corrugated shipping container, and the units then advance toward a booster belt. The latter discharges the containers to one of several gravity roller lines which serve as "live" sorting and collection stations.

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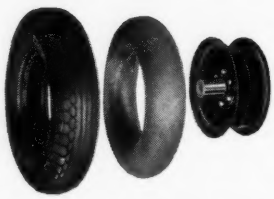

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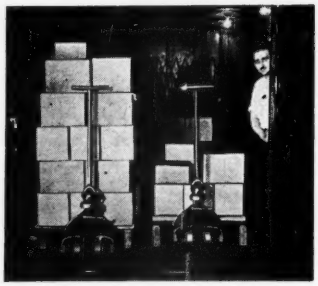

A pair of Hydraulic RED GIANTS facilitate transfer from floor to floor.

Put RED GIANT hand Liftrucks to work for you for easy moving of heavy articles in shop, warehouse or factory, for loading and unloading and many other jobs which do not require the expense or weight of a power truck. Low first cost and low operating expenses. Arc welded steel members give RED GIANTS great rigidity. They roll easily on Timken bearings. 5 Models—capacities to 15,000 lbs. Send for catalog stating weight and size of material to be handled.

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DESIGNERS AND MANUFACTURERS OF MATERIAL HANDLING EQUIPMENT
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The seven parallel gravity roller lines all lead to one line which feeds to the case gluer at the other end of the room. Two interesting switches are used to shunt the containers to their ultimate destination. The main switch is just ahead of the case gluer (see exhibits), which is pivoted at this end and swings in a 90-degree arc at the other to receive the units from four of the seven conveyor lines. The end point of the fourth of these lines is another flexible switch. It receives the cases from the remaining three of the seven lanes. The two switches are, of course, aligned and locked up when necessary to form a continuous line. The free end of the switches is supported on two wheels which run in a channel track. Thus, by setting a switch, the containers from any of the seven lanes are routed to the gluer (after sufficient units of one size have been accumulated), then through a 40-foot-long compression unit. Two counters are attached to the gluing machine.

From the compression unit, an inclined booster belt delivers the cases to an overhead gravity roller line which leads across a covered railroad siding to the shipping-warehousing building. A powered 36-inch belt conveyor runs the full length of this 200-foot-long room. The cases arriving from production ride on the upper section of the belt, which runs over pulleys 36 inches in diameter. This gives a three-foot clearance between the incoming and return belt lines, which are made to serve a double purpose. That is to say, the lower or return belt is used for routing outgoing cases either to cars or trucks, the shipping area for both being located at that end of the building. The transfer to these points from the main line is accomplished by a deflecting arm, a booster belt and gravity wheel conveyor sections. A telescopic conveyor delivers the containers to the hands of the loaders.

Cut materials handling costs with
U. S. INDUSTRIAL TIRES

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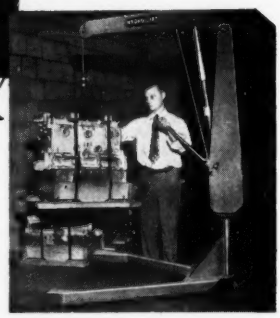
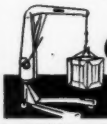


HYDRO-LIFT with its quick change feature provides the utility of both a truck and a shop crane for the price of one. Ideal for delivery trucks, garages, production shops, manufacturing plants, etc.
Write for FREE bulletin today.



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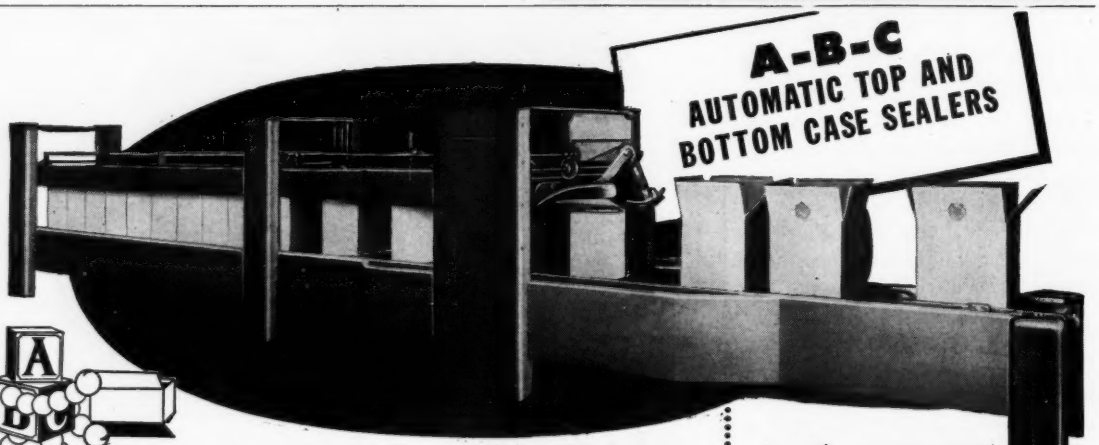
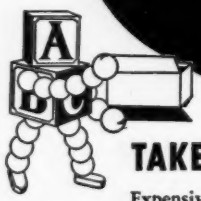
A-B-C
AUTOMATIC TOP AND BOTTOM CASE SEALERS





TAKE THE "HAND" out of HANDLING

Expensive sealing operations are done faster, more economically with the streamlined A-B-C Top and Bottom Case Sealer. A recent installation in one plant saved $4000 the first year. Cases are sealed directly from the production line at speeds up to 60 cases per minute. It's all automatic. No operators required. Top inner flaps are tucked as bottom outer flaps are opened without disturbing contents of case. Glue is applied both top and bottom and outer flaps folded in place simultaneously. Compression unit with individual spring rollers applies even pressure to complete the sealing job. Unit can seal top flaps only or bottom flaps only. A-B-C specializes in building packaging machinery exclusively. Let an A-B-C specialist help solve your packaging problems. Write A-B-C PACKAGING MACHINE CORP., Dept. M1, Moberly, Mo.

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- Simple, sturdy construction for minimum down time . . . low maintenance cost
- Adjustable to wide range of case sizes by pressing a button
- Glue applicator and compression unit supported at 4 points for even pressure
- All main drives ball bearing equipped—geared head motors

A-B-C

PACKAGING MACHINE CORP.

MOBERLY, MISSOURI

OTHER A-B-C PRODUCTS
Automatic Top Sealer • Automatic Side Sealer • Semi-Automatic Bottom Sealer • Hand Gluer • Glass Container Case Packer

"KEEP EVERYTHING MOVABLE"

(Continued from page 27)

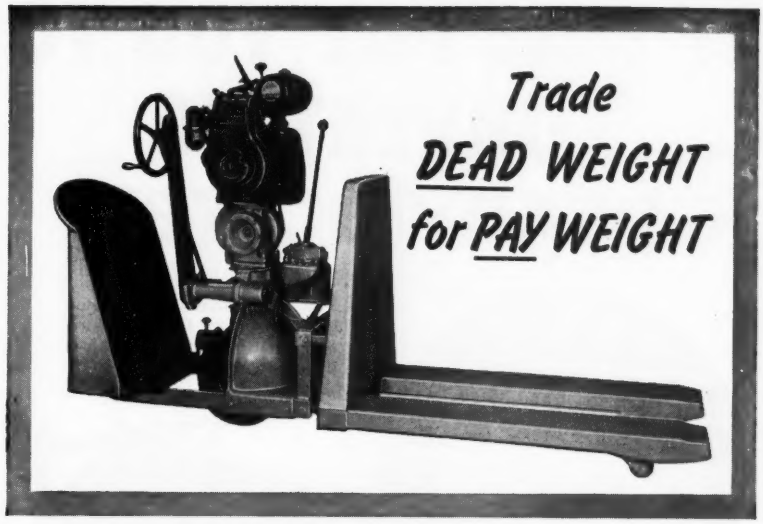
trucks. This unit is used primarily for order picking purposes, and only a few are required. Thus an extra pallet size has been avoided and at the same time the need for a special load carrier of relatively limited use has been met.

Thus far, the description applies to operations on the ground floor. On the second floor, radios, upholstered furniture and similar nontierable items are stored. These items are usually of lesser bulk or height than those stored in the previously mentioned seven-foot-high pallet racks. The problem here, too, was to avoid single-deck storage. The solution was found in conventional wooden horses, designed with slots for 10-foot-lengths of 2" x 4" supporting runners at each end. Sliding boards are laid over the 2" x 4" pieces, thus forming a double layer arrangement, one for a tier on the floor and a second layer on top. Where the size of the merchandise permits,

The
"LITTLE HUSTLER"
TRANSFERS STAMPINGS AS FAST AS PRODUCED!

The "Little Hustler" is fully portable and quickly adjustable to a wide range of applications. The 8 foot size shown above has a maximum delivery height of 81 inches at 45° and 50 inches in a horizontal position. Made in 13 models: 4-6-8-10 and 12 ft. long, by 12", 18" or 24" wide. Also special sizes. Send for circular LHC. We design and manufacture permanent conveyor systems and all types of SPECIAL EQUIPMENT

MAY-FRAN ENGINEERING, INC.
Development Engineering and Manufacturing
1710 Clarkstone Rd. Cleveland 12, Ohio



WITH THE 3000 POUND PAY LOAD

truck-man pallet toter

You *know* what it costs, per ton, to 'spot' material with a hand truck—or a heavy stacking truck. But there is a practical way! That's why we designed the Truckman PALLET TOTER; payload, *3000 pounds and more* – weight 920 pounds, ready for action! It incorporates the same dependable power turret you found so successful in Truckman Model D Hydraulic Lift Truck and Truckman Platform Utility. It's agile, rugged, simple to operate and maintain. It has scores of features important to you, including:

- **Nationally known Wisconsin gasoline engine, famous for faithful service...**
- **Hour-after-hour efficiency—no battery charging lay-ups or equipment costs...**
- **One-lever control of clutch and brake. Powerful hydraulic fork lift...**
- **Rubber insert load wheels to soften jolts, pneumatics for driving traction...**
- **Safe, comfortable, untiring handling by operator who *rides with the load*...**
- **Well balanced design, heavy welded construction, ready for hard service.**

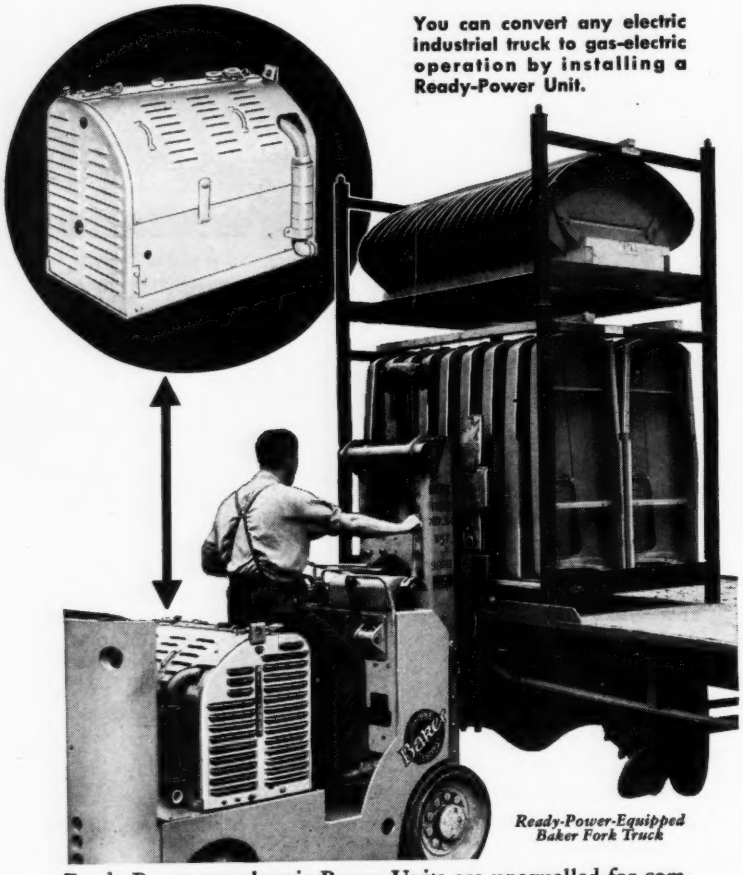
To top all this, your Truckman PALLET TOTER is available for $850, f.o.b., Jackson, complete, including 48" forks. And you can put it to work without buying a single "extra." Yes, this is your answer where costs count: PALLET TOTER, a light, economical unit for horizontal movement of pallet loads. Write for our new Model DF Bulletin—or the name of our distributor in your area.

$850
F.O.B. JACKSON

Ask Any Operator Over 70 Truck-Man distributors in principal cities provide standard service.

truck-man INC.
1418 West Ganson, Jackson, Mich.

IT WILL PAY YOU TO CONVERT TO READY-POWER



You can convert any electric industrial truck to gas-electric operation by installing a Ready-Power Unit.

Ready-Power-Equipped Baker Fork Truck

Ready-Power gas-electric Power Units are unequalled for completely dependable power, hour after hour, day after day. A Ready-Power Unit will be installed by an electric truck manufacturer on any new truck you order... but you don't have to wait for that because you can convert any electric truck you now have. Write The Ready-Power Co. today for complete information.

Ready-Power-Equipped Crescent Platform Truck

THE READY-POWER CO.

3838 Grand River Ave., Detroit 8, Michigan

the horses are so constructed that a third and fourth layer can be built. The point is of course that these units, like several of the others mentioned, can be quickly assembled or disassembled as the volume of merchandising changes require, or they can be shifted to new locations.

Another movable fixture is the pallet-type storage bins for certain sizes of linoleum rolls. The vertical members of these nine-foot-high, crossbraced racks are supported by nailed cleats, tying each of two adjoining units. Should it become necessary to move any of the bins, the job can be done in a few minutes. The cleats are easily knocked off, and a pallet hand truck or powered fork truck will move the pallet-base unit to the desired location. (The installation of mechanized linoleum storage and cutting equipment is now nearing completion.)

Quick Location and Parcel Classification

A locater system is used so that all merchandise is quickly located when needed. (Bay markers in the east-to-west direction are by initials, in the north-to-south direction by numbers.) General classifications of merchandise are usually assigned to the same areas. Each piece of merchandise that enters the building is marked with its location number. A locator tag is made out bearing the same number and indicating the floor and bay. This tag is kept on file in the locator office. Any piece of merchandise is thus instantly located by anyone able to follow the figures on the tag to the corresponding bay number. (The wooden horses on the second floor are similarly identified, the one on the right-hand side carrying the number.)

While parcel delivery is not properly a part of the hard goods warehouse function—the operation is located in the adjoining garage building—it is too important a part of the over-all job to be omitted here. The new warehouse receives parcels from all Goldblatt metropolitan stores for delivery to indi-

vidual customers. Thus the plant acts as a central classifying and distribution point for these thousands of packages.

The classifying procedure is as follows. The incoming trailer backs up against a dock in the south part of the garage building. A 4′ x 325′ rubberized conveyor belt runs at this point in a south-to-north direction, traveling at approximately 15 F.P.M. The parcels are placed on this line (which here travels at floor level). Near the start of the line an operator in a pit routes each package according to its delivery zone by marking a number on it with a crayon. These numbers correspond to bin sections on shelves, which are located to both sides of the belt. Another point of importance is that the numerical order is arranged so that the packages will be loaded into the outbound trucks in accordance with the stops on the routes. That is, packages to be delivered first are loaded last, and so on, eliminating any searching and rehandling in the vehicles during delivery.

TRADE MARK

Razorback Pallets

are made in the

MOST MODERN PALLET PLANT

in the nation!

When you buy Razorback Pallets you get the *best* . . . but straight-line production keeps our prices competitive with ordinary pallets! Manufactured to specifications and shipped when promised! Write us or see our representatives in major cities.

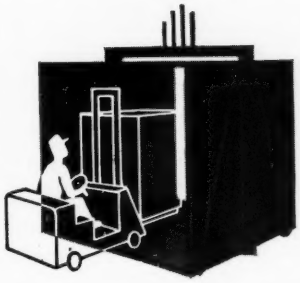
ARKANSAS PALLET CORP.

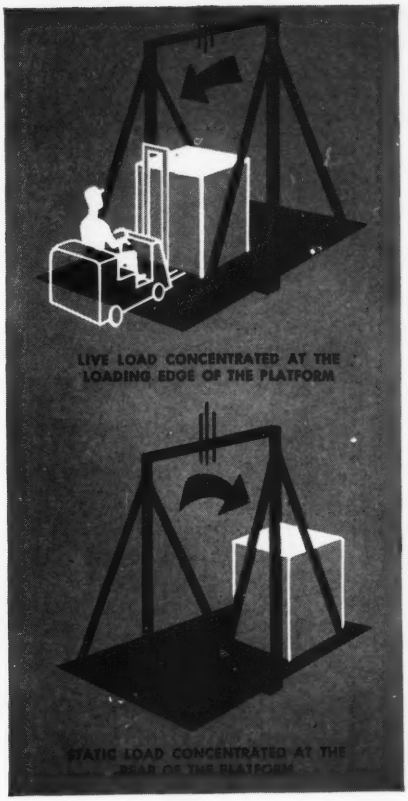
Plant and Sales Office in

PINE BLUFF, ARKANSAS

P.O. Box 794-A Phone 6474

250% more 'tilt'

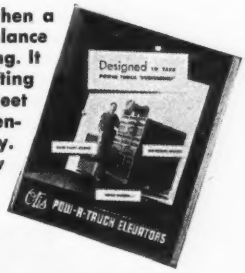




ON POWER TRUCK FREIGHT ELEVATORS. Let's watch the 'tilting' action as a power truck loads a freight elevator. A power truck may weigh 8,000 pounds, or more, plus its proportionately heavy pay load. It suddenly concentrates its total weight at the front of elevator; then its pay load at the rear. It tends to 'tilt' the entire elevator structure forward; then backwards —as it loads off-balance. It sets up forces that exceed those of hand truck loading, by as much as 250%.

Obviously, power truck freight elevators must be specifically designed—*to withstand the 'punishment' of off-balance loading.* That's one of several good reasons why you should change your thinking about freight elevators when you change from hand truck to power truck loading.

FREE! OTIS Bulletin B-705F explains what happens when a power truck 'punishes' a freight elevator with off-balance loading . . . impact loading . . . and extra static loading. It shows how OTIS Pow-R-Truck Freight Elevators, with lifting capacities from 8,000 to 20,000 pounds and over, meet these severe stresses. And it also gives platform dimensions and hoistway requirements. Write for your copy. Otis Elevator Company, 260 Eleventh Avenue, New York 1, N. Y.



Otis

STANDARDIZED

POW-R-TRUCK ELEVATORS

DESIGNED TO TAKE POWER TRUCK 'PUNISHMENT'

MULTIPLY MANPOWER · LEWIS-SHEPARD

Buy at the Sign of

THE "MASTER" LINE

OF

MATERIALS HANDLING EQUIPMENT

Designed, Engineered, Manufactured and Distributed under this Internationally Known Trade Mark.

INDUSTRIAL TRUCKS

"JACKSTACKER"

"JACKLIFT" POWER MODEL

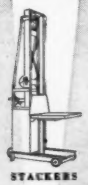
HYDRAULICS

"JACKLIFT"

"REDILIFT"

SKID PLATFORMS

FLOOR TRUCKS



STACKERS

MULTIPLY MANPOWER · LEWIS-SHEPARD

The *Sign of The* "MASTER" LINE

Put L-S "Mechanized Muscles" at work in Your plant. They Multiply Manpower, slash your cost of doing business, make you another of the hundreds of thousands of friends of the "MASTER" LINE.

No matter what your plant layout, your width of aisles, your type of materials, your storage or production set-up . . . there's a "MASTER" LINE product or combination of products to solve your handling problem and pay for itself over and over again. Let's get together.

Send for this 86 page Catalog of THE "MASTER" LINE

MULTIPLY MANPOWER · LEWIS-SHEPARD

ESTABLISHED 1915

LEWIS-SHEPARD PRODUCTS INCORPORATED

115 WALNUT STREET

WATERTOWN 72, MASS.

REPRESENTATIVES IN PRINCIPAL CITIES — CONSULT YOUR PHONE DIRECTORY

The marked packages travel north to the bin locations, where operators take the parcels off in accordance with the route numbers, loading them into the bins in the order described. The bin section on each side of the distribution belt is flanked by a driveway, where the delivery trucks back up for loading. The many thousands of packages are thus classified and distributed with the greatest motion economy possible.

"Keep it movable" is thus well exemplified in this Goldblatt Department Store furniture warehouse. Every fixture, built in sections, can be moved or rearranged as new needs arise. The management's attitude is strictly experimental, and new accessories, or improvements on existing ones are constantly being scrutinized for a better way of doing the job. One of the latest efforts to maintain the operation at an efficient level is the current installation of a cost analysis system. This will be designed to show all handling costs.

DICO *Float-Away* BARL & DRUM TRUK

STANDS ALONE

When not in use, the New DICO "Float-Away" Truk stands by itself in an upright "SAFETY FIRST" position. Never necessary to hang it over barrel chime, lay it down or lean it against the wall. Approved by safety engineers.

HERE IS WHY

Detail of Exclusive Dico "Float-Away" Telescoping Compression Spring Cylinder Assembly between axle of retractable wheel carriage and lower cross member.

MOVES THEM EASY!

Unique in Design—Axle Assembly and wheels never leave the floor. The light weight, perfect balance and smooth operation of the "Float-Away" enables one man to handle heaviest drums all day long without usual fatigue. It is outstanding in engineering ingenuity and adaptability.

ASK YOUR JOBBER, or write direct to DICO MANUFACTURING CO., Division of

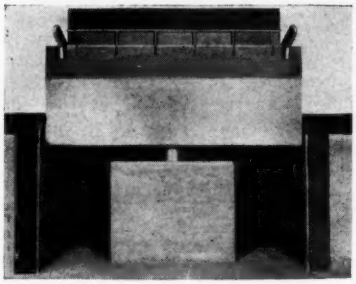
DICO CORPORATION

404 S.W. 16TH ST., DES MOINES 9, IOWA

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13, or use postcard bound into this issue.

HYDRAULIC RAMP

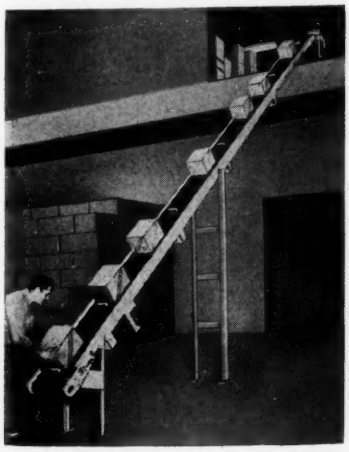
NP1—A new hydraulic device, the Leva-Dock, is being manufactured by Rotary Lift Co. The Leva-Dock is a hinged platform supported by a hydraulic jack. With the front end of the platform raised, the truck or trailer



is backed into position. The platform is then lowered onto the truck or trailer floor. When the hydraulic system is released, the platform has free play.

FLOOR-TO-FLOOR CONVEYOR

NP2—The A. B. Farquhar Co. has introduced a permanent floor-to-floor conveyor. It is designed for the continuous flow of light-weight bags,



boxes, cases, cartons, etc. Engineered as a complete unit including motor mounting, the conveyor is available in lengths from 14′ to 32′ with a 12″ wide belt. It is designed to carry a maximum load of 250 lbs. or for handling units of 75 lbs. each.

EXPENDABLE PALLETS

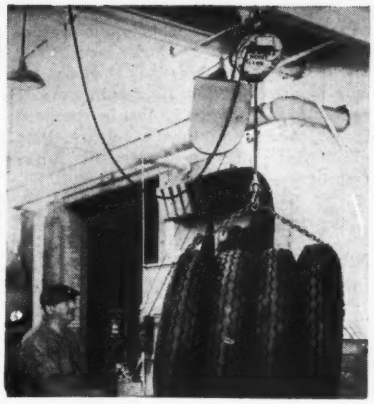
NP3—A line of expendable corrugated

Why ?
ENGINEERED DESIGN PALLETS ?

"Tailoring" is important in warehousing, too . . . it means efficiency and economy.

ENGINEERED DESIGN pallets are tailored to meet the particular needs of your operation. Write, wire or phone today for free estimates.

Pallets Incorporated
Manufacturers of
ENGINEERED DESIGN *Pallets*
GLEN FALLS, N. Y.



means more profit . . .

A 'Budgit' Electric Hoist means more profit to the man who uses this fast, easy-to-operate hoist to do his lifting at machines, at assembly benches, production and inspection lines.

'Budgit' Electric Hoists lift and handle loads so easily, they conserve the worker's energy and allow him to turn it into increased production. 'Budgit' Hoists lift so speedily, they add many minutes to every working hour in the day — and, time saved means increased profits. With production up, operating costs go down. That's profit, too!

The cost of installing a portable 'Budgit' Hoist is nothing, for a 'Budgit' is a complete lifting unit in itself. You simply hang it up, plug into the nearest electric socket, and use! That means production begins immediately. Savings, too!

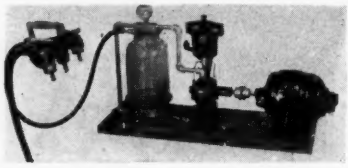
Made in sizes to lift 250, 500, 1000, 2000 and 4000 lbs. Prices start at $119. Write for Bulletin No. 371.

MAXWELL MANNING MOORE TRADE MARK
'BUDGIT' *Hoists*
MANNING, MAXWELL & MOORE, INC.
MUSKEGON, MICHIGAN
Builders of 'Shaw-Box' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of Ashcroft Gauges, Hancock Valves, Consolidated Safety and Relief Valves and 'American' industrial instruments.

paper board pallets is being manufactured by Addison-Semmes Corp. They are designed for four-way fork entry, with single or double face, with weights ranging from 3½ to 15 lbs. in standard types. According to the release, they eliminate pallet returns and lower freight cost.

BOTTLE AND CAN FILLER

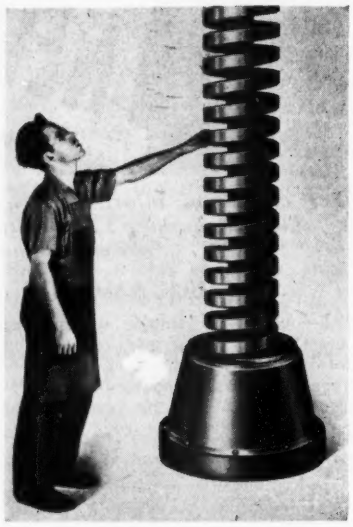
NP4—The Scientific Filter Co. is offering a bottle and can filling machine. It is designed for all shapes and sizes of glass and round cans, and for rectangular cans up to one quart. This bench type portable vacuum filler handles a large variety of liquids, light and heavy, and fills all types of containers from vials to gallon jugs. The spouts are equipped with adjustable rubber washers which seal the tops of



the bottles causing the vacuum. It is stated that any excess liquid is withdrawn into an overflow jar mounted adjacent to the container.

VERTICAL SPIRAL FEEDERS

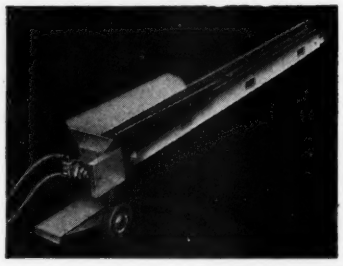
NP5—A new way of elevating or lowering various types of bulk materials has been announced by the Syntron Co. With the use of its Vibratory Vertical Spiral Feeders, foodstuffs, chemicals, articles, etc., can be moved without using buckets, sprockets, gears, chains and motors. Highspeed vibra-



tion causes the material to flow up and around the ramp at rates controllable by a rheostat or reactor provided with each unit. According to the release, there is no turning or rotating of the spiral ramp—vibration alone does the job.

HYDRAULIC CONVEYOR

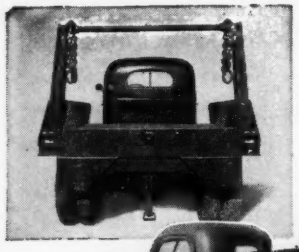
NP6—The Bosworth Mfg. Co. announces the latest addition to its line of self-powered loading and conveying equipment. A hydraulic-powered conveyor, to be known as the Turbo-



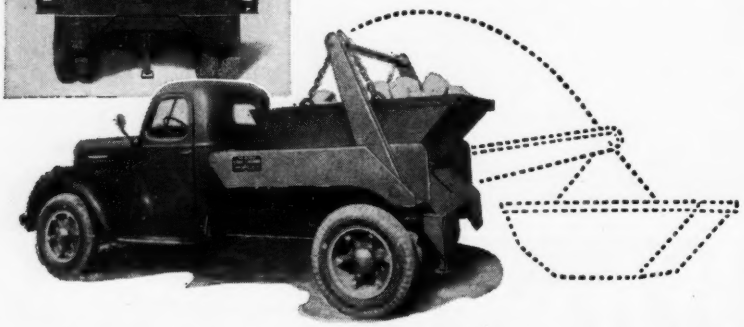
Trimmer, it can be attached to any type truck or trailer providing that the unit to which it is attached has its own motive power take-off. It can be elevated to discharge at an eight-foot height, and models are available with eight-inch and 11-inch width belts.

DIPPING BASKETS

NP7—A new standard line of insulated baskets for dipping, pickling and general use in submerging parts or products in corrosive solutions, is announced by Automotive Rubber Co. The baskets, fabricated of heavy gauge, reinforced perforated steel with welded joints, are completely covered with ⅛" thick, shock-proof, semi-hard pure rubber. Four sizes of perfora-



No other Equipment as VERSATILE!



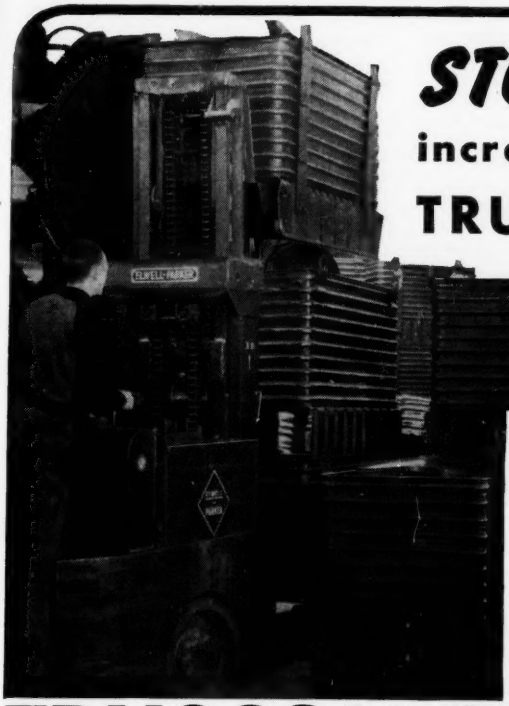
MATERIALS HANDLING SOLVED

● When it comes to handling materials easier, faster, cheaper — no other equipment of this type can compete with the Brooks Load Lugger system of loading, hauling and dumping. You can install a flat bed Brooks Load Lugger on any standard truck and use it with 10 to 30 detachable truck body containers, thus keeping your men busy always loading while your trucks are always hauling. Or, you can set container down on the ground or in the plant, and presto — you have the same truck as before, ready for general hauling purposes! Whether you deal in solids, liquids or dust — Brooks engineers can design a system of containers to solve your particular materials handling problem. Capacities — 1 to 10 cu. yds. Write for free catalog.

BROOKS EQUIPMENT & MFG. CO.
704 DAVENPORT RD., KNOXVILLE 1, TENN. U. S. A.

Brooks LOAD LUGGER
TRADE MARK REGISTERED

LOAD LUGGER · DAY PULVERIZER · CANE LUGGER



STORAGE EFFICIENCY

increased by the versatility of TRUSCON STEEL BOXES and SKIDS

● Pile 'em high... pile 'em compactly... put 'em wherever there's a few square feet that are not being used profitably. That's the way to fully utilize the space-saving orderliness of Truscon Steel Boxes and Skids. By hand, by truck or by crane, Truscon Steel Boxes and Skids assure more efficient storage of parts, materials and products; also more efficient movement of these items throughout the plant.

Write for illustrated catalog on Truscon Steel Boxes and Skids to help get jobs done better and faster in your plant.

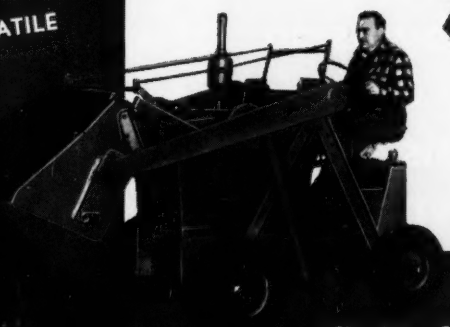
TRUSCON STEEL COMPANY

PRESSED STEEL DIVISION • 6202 TRUSCON AVENUE • CLEVELAND 4, OHIO
SUBSIDIARY OF REPUBLIC STEEL CORPORATION

ECONOMICAL
EASY RIDING
LARGE CAPACITY
HUSKY, FAST
HIGH LIFT
SIMPLE CONTROLS
VERSATILE

Does the work of 6 men

BUTLER *Yardscoop*

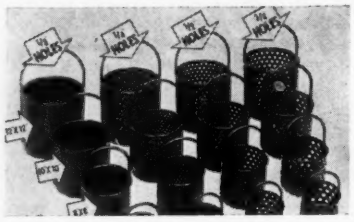


Versatile, hard-hitting brother of the Butler Carscoop,— the YARDSCOOP is built for rugged, outdoor work. Rubber tired, interchangeable wheels carry the YARDSCOOP over rough terrain. Ample power takes it up steep grades or at time saving speeds from spot to spot in factory yards. Its easily controlled scoop has a ten cubic foot capacity and a talent for handling an astonishing variety of materials.

G. N. Crawford Equipment Co.

6714 KELLY STREET PITTSBURGH 8, PA.
Phone EMerson 7600

tions are offered with finished hole



sizes of ⅛", ¼", ½" and ¾".

CONVEYOR BELT FASTENERS

NP8—Armstrong-Bray and Co. have developed a line of fasteners and repair plates for heavy-duty conveyor belts. They are designed to be applied anywhere, and pull belt ends together into a smooth, flexible tight joint. Made of heavy gauge steel, they may be individually spaced and permit troughing. Fasteners are provided for belts from ¼" to 1½" thick. Companion repair plates are available for repairing tears and cuts or for inserting patches in worn spots.

INSTITUTE NEWS . . .

(Continued from page 36)

on the same dates as the Third Annual Industrial Packaging and Material Handling Exposition in Chicago. The committee did not want to conflict with any other group, and also felt that it did not have sufficient time for such an undertaking.

THE next meeting of the national Material Handling Institute will be held at the Hotel Cleveland, Cleveland, Ohio, October 26. The speaker will be George D. Gaw, director of the Color Research Institute of America. His subject will cover "Color In Industry".

The Caster and Floor Truck Manufacturers' Association has scheduled its next meeting for the Hotel Cleveland on the following day, October 27.

THE following men were appointed as representatives from the Material Handling Institute on the Chapter Advisory Board: S. D. Gibson, Crescent Truck Co., E. R. Ransom, Richards-Wilcox Mfg. Co., W. G. Reycroft, The Bassick Co., J. W. Wunsch, Silent Hoist & Crane Co., and N. L. Cahners, Modern Materials Handling Magazine. The following representatives have thus far been appointed by the various chapters: New England Chapter, Walter Metcalf; Midwest Materials Handling Society, Irving M. Footlik; Indiana Materials Handling Society, W. W. Phillips; Syracuse Chapter, A. K. Strong; and Toledo Chapter, E. W. Marek.

HARRY E. STOCKER, material handling consultant, spoke at the September meeting of the Midwest Material Handling Society at the Midland Hotel, Chicago. Stocker is president of H. E. Stocker Assoc., Inc., material handling consultants in New York, Boston, Chicago, and San Francisco. The fall-winter program set up by the Midwest Society covers a wide range of subjects. They include Planning a Completely Palletized System, The Labor Relations Aspect of Material Handling, Attacking the Material Handling Problem in the Plant Warehouse, and Material Handling Techniques in the Automotive Industry.

DARNELL CASTERS
for Every Type of Floor
DARNELL CASTER & WHEEL MANUAL
FREE Manual
• Save Money, Floors, Equipment and Time by using DARNELL Casters and Wheels . . . Always dependable.
DARNELL CORP. LTD. 60 WALKER ST. NEW YORK 13, N.Y.
LONG BEACH 4, CALIFORNIA 36 N. CLINTON, CHICAGO 6, ILL.

How Pepsodent PRODUCES MORE IN 1/3 LESS SPACE

with an A-F *ENGINEERED* Conveying System

In the Pepsodent plant, an A-F ENGINEERED Conveyor System saves valuable floor space. A-F Overhead Belt Conveyors feed production lines and special conveyors handle bottles for antiseptic production. The lines shown here rise from carton machines to belt work tables on the floor above. At night the lines act as storage banks.

A-F Engineers will help you solve YOUR handling problem just as efficiently. Write today for folder describing various types of installations.

THE ALVEY-FERGUSON COMPANY

437 Disney St. Established 1901 Cincinnati 9, Ohio

Offices or Representatives in Principal Cities Coast-to-Coast

CONVEYING EQUIPMENT

Alvey-Ferguson

METAL PRODUCTS CLEANING EQUIPMENT

EASY MATERIALS HANDLING

BURRO takes materials handling jobs liks this in stride . . . does them with the same smooth speed and economy characteristic of this powerful, speedy locomotive crane, whether it's working with clamshell bucket, tongs, magnet, drag-line bucket or hook. BURRO's heavy draw bar pull (7500 lbs.) and fast travel speeds (up to 22 MPH) make it an efficient switch engine too. You can spot cars *where* and *when* you want them, eliminating the "waiting time" which interrupts production and increases costs.

Write for illustrated Bulletin
There is no obligation.

CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.

1320 South Kilbourn Avenue Chicago, Illinois

Barber-Greene

Mechanize Now!

WITH THE ONE-MAN MACHINE THAT DOES

all 3...

1 Car unloading

2 Stockpiling

3 Loading — screening

Save

MANPOWER, INVESTMENT, DEPRECIATION WITH THE B-G 661

The B-G 661 Gooseneck makes it possible to mechanize all coal unloading, stockpiling and loading operations—to speed up and effectively cut the cost of all three. This self-propelled machine combines Truck Loader with power driven Car Unloader and Stacker to enable one man to handle all basic coal-moving work around the yard or plant. To learn more about the savings a 661 Gooseneck can mean to you fill in and send for new literature. Address Barber-Greene Co., Aurora, Ill.

With a 661 Gooseneck and Unloader-Stacker attachments, you can:

- *Unload all sizes of coal from car in 90 minutes*
- *Load trucks at 1½ tons per minute*
- *Screen coal with vibrating screen*
- *Stockpile to elevation of 20 ft.*
- *Load largest trucks, regardless of sideboards*
- *Move equipment under its own power*

BARBER-GREENE COMPANY, AURORA, ILLINOIS

Constant flow Equipment

MANY HANDLING IDEAS . . .

(Continued from page 49)

Housekeeping, Safety, Efficiency

In an operation such as ours where tens of thousands of blocks are handled daily, a certain amount of breakage is to be expected. Broken pieces of block lying about are a hazard to man, machine, and material. To avoid accidents in this respect, we observe a systematic clean-up procedure that provides for the immediate removal of scrap from floor areas.

For this purpose, we use a 26" x 46" x 50" metal waste box with a drop bottom, illustrated on these pages. Of welded construction, the box is made of ⅛" sheet plate with a 6" channel base on both sides for legs. The bottom plate, in two halves, is hinged on each side and operates with a drop gate control lever. Welded to offset across the top of the container are two ¾" x 3" steel bars which provide clearance for entry of truck forks.

When full, the container is picked up by a truck and suspended over the dump truck body, and the refuse is discharged. These containers are spotted about the operating areas, and any scrap is immediately shoveled into them. Thus any refuse is confined within the boxes and the disposal is made simple and effortless by use of our fork trucks.

Continued Effort for Top Efficiency

A glance at the flow sheet shows the relatively small area taken up by our production operation—about five per cent of the space. The remaining 95 of the area involves handling of the materials. In other words, handling is the big problem in such an operation as ours, by a wide margin.

The adoption of the fork-truck-cube method several years ago has meant great advantages in terms of lower per-ton handling cost. But maximum efficiency from cube handling depended to a large extent on the development of the refinements here outlined and discussed. It is these refinements, or important details, which have given us an integrated material handling system. The spring steel forks on the off-bearers have aided production; the two-cycle curing system has had a far-reaching effect on the handling procedures. Similarly, storage practices, housekeeping and shipping have been aided by specific methods and devices.

Continued study of certain phases of the operation is necessary, we feel, in order to maintain top efficiency of the handling system. A good example is our present search for a portable unloading device on our trailers that will approach the efficiency of loading by use of our fork trucks.

Watch for the new enlarged 1949 FLOW Directory. It is an indispensable aid for every material handling engineer, shop superintendant and others responsible for efficient material handling operations.

Photo Courtesy Crown Cork and Seal Co. illustrates A-21 SHOP MULE

SHOP MULES *preferred* BY 73 INDUSTRIES

OPERATIONAL ADVANTAGES OF THE VERSATILE A-21

1. Large diameter pneumatic rear wheels for easy operation over track crossings and other rough ground.
2. Quickly adjusted to 6 overall widths 40½" to 61".
3. A separate hand brake for each rear wheel permits locking of one wheel to give shorter turning radius.
4. High ground clearance.
5. Adjustable draw bar effort (by adding wheel weights for extra traction).
6. FOUR forward speeds and one reverse.

MAINTENANCE ADVANTAGES

1. Very fast, world-wide parts and service. Parts are conveniently stocked all over the world. Therefore, parts are quickly available, *in your own area*—service is fast—there is a very minimum of delay for necessary replacements.
2. Replaceable cylinder sleeves ALL IN ONE SEALED PACKAGE. You may save 50% on this feature alone. New pistons and rings—already fitted in new cylinder sleeves (all in ONE Sealed Package)—provide virtually a new engine for about half the cost of the usual re-bore job. All this with an average *saving of several days lay-up time.*

Find out why famous International Harvester powered SHOP MULES are preferred in 73 Industrial Fields. Send for full specifications and operating data. Just tear out this ad and mail with your letterhead and name — TODAY!

SHOP MULE INDUSTRIAL TRACTORS

W. F. HEBARD & CO.

336 W. 37TH STREET, CHICAGO 9, ILLINOIS

Hurry - - - Don't miss out on $1500 in prizes. The FLOW Cost Analysis Contest closes Nov. 15. Write for your entry blank today. Be eligible for one of the five valuable cash prizes.

TOOTSIE ROLLS . . .

(Continued from page 22)

The lowest shelf on these trucks is 15½ inches above the floor. Thus all three levels are at an optimum height to receive the pans with minimum stooping on the part of the operators. These trucks are of the tilting type, with a 1-2-1 arrangement of the rubber-tired casters.

Here is another detail of sound production engineering. The conveyor table was designed with a height of 46 inches above floor level. This is just below chest level, enabling the operators to remove the full pans with minimum lifting effort. Other methods have been similarly engineered by the company's industrial engineering department in order to minimize the fatigue factor and to make each job as easy as possible. In other words, proper positioning of conveyor carrying surfaces should be carefully considered for maximum productive output with minimum effort.

It was previously noted that the sized lengths of candy are delivered linked from the machine, approximately 20 rolls in each length. Thus an operator with one "scooping" motion of both hands picks up a sizable amount of the material. This makes both for a quick grasp and quick disposal into the pans. If, instead, individual pieces were delivered, the amount of handling would be excessive.

The loaded candy carts are moved across an aisle to an automatic final sizing and dispensing machine, where the individual rolls are unlinked by an operator as she feeds them into the machine. Passing between further guides and sizing rolls, the individual pieces are reduced to the diameter of the finished candy size. The lengths are then fed to a battery of powered cutters which cut the individual sections for the small size of Tootsie Rolls. The pieces drop from the rotary cutters onto a 12-inch canvas belt which delivers, via chute, to the second-floor packaging department. (See the packaging description of the five-cent Tootsie Rolls in the Packaging Mechanics Section of this issue.) Here, too, defective shapes are instantly conveyed to the central salvage system that returns the material to the fourth-floor manufacturing department.

Thus the carefully engineered integration of a variety of castered equipment into the conveyor system results in a continuous flow on several floor levels. Handling of many small pieces is held to an absolute minimum. Transfers are quickly accomplished between work stations, safe and sanitary practices are aided, and individual jobs are made as easy as possible through proper positioning of work levels.

SHIP
For YOUR Industry's Every LUMBER NEED
Our entire organization is thoroughly skilled and equipped to handle every industrial lumber need efficiently and economically. Trained industrial lumber specialists are ready to provide the answers to your problems. From the drawing board to the finished product, our specialists will design and build to your most exacting specifications.
And Sterling's two complete plants . . . in Chicago and Goodwater, Alabama . . . are equipped to provide faster, finer service. The combination of local skilled staffs and reduced mill operating costs at the source of lumber means efficient and economical service to you. Call on Sterling for industrial lumber products made to your exact specifications.
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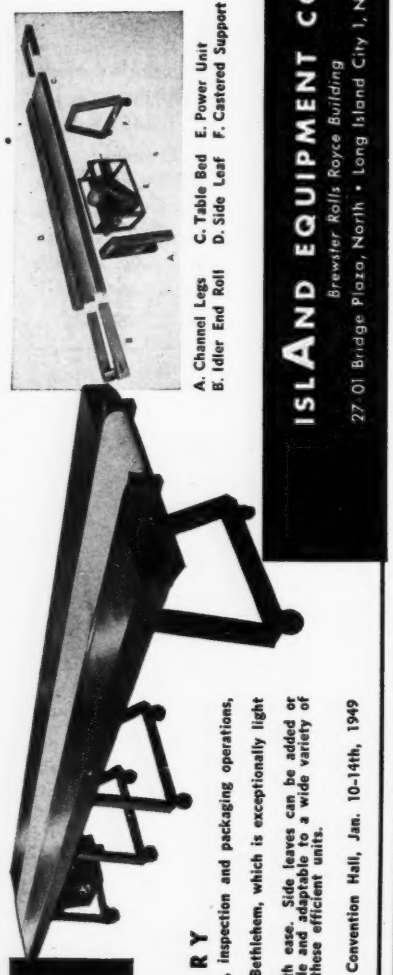
PUllman 5-0220



ISLAND EQUIPMENT CORP.
Brewster Rolls Royce Building
27-01 Bridge Plaza, North • Long Island City 1, New York

ISLAND UNITIZED ONE PIECE WELDED STEEL ALL STEEL CONVEYOR TABLES

INTRODUCING MAYARI-R, BETHLEHEM'S HIGH STRENGTH CORROSION RESISTING STEEL
● PORTABLE OR STATIONARY

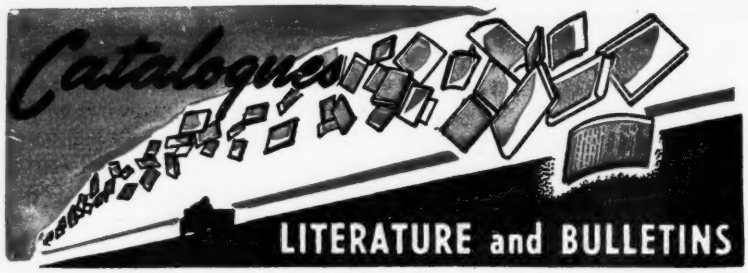
Here is an ALL purpose conveyor . . . a mechanized table for assembly, inspection and packaging operations, especially designed for convenience and economy of operation.

This new table utilizes the famous Mayari-R Corrosion Resisting Steel of Bethlehem, which is exceptionally light in weight, though very strong.

UNITIZED Conveyor Tables can be lengthened, shortened, or moved with ease. Side leaves can be added or removed quickly. The special construction makes these units very flexible and adaptable to a wide variety of application. Note in illustration the minimum of parts which comprise these efficient units.

Write today for Bulletin IP-1

See us at the 3rd National Material Handling Exposition, Philadelphia Convention Hall, Jan. 10-14th, 1949



The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

25—Gummed Tape . . . A 64-page book, entitled Gummed Tape User's Handbook, has been published by Better Packages, Inc., as a comprehensive guide to more efficient selection, moistening and application of gummed tape. In addition to discussing the use of gummed tape under average conditions, the book takes up special moistening problems created by high-speed dispensing, heavy tapes, hard and cold water, and by various types of carton surfaces.

27—Management Skill . . . The American Management Association has issued two quizzes by which supervisors, foremen and higher executives can test their knowledge of managerial principles and their ability to lead workers. It tests for knowledge of principles of organization, basic literature of management, methods of training, and psychology of leadership.

28—Power Belt Conveyor . . . A new two-color, single-sheet bulletin describing and illustrating the Stevedore, Jr., power belt conveyor, has been issued by The Rapids-Standard Co., Inc. The bulletin contains a photograph of the unit in the 11 foot frame length size being used to load a truck, and copy explains the various features incorporated in the model.

29—Bottle Labeling . . . Paisley Products, Inc., offers a six-page, illustrated, two-color bulletin on bottle labeling adhesives, application techniques and label selection data. The comprehensive nature of the material included is of interest to new users of bottles for packaging purposes as well as to old users who wish to re-examine their bottle labeling operations.

30—Industrial Locomotive . . . A 14-page, 4-color booklet describing its 45-ton capacity industrial locomotive is available from the General Electric Co. Industrial applications are given together with engineering data, and specifications. Pictures of component parts as well as the entire model are included.

31—Grain Car Unloader . . . The Link-Belt Co. has issued an eight-page folder on its grain car unloader for rapid mechanical unloading of grain or soybeans from box cars. The model consists of a structural steel cradle, so mounted on rollers at four points to permit endwise tipping at 40 degrees from the horizontal in either direction, and a car supporting platform pivotally mounted to permit sidewise tipping to an angle of 15 degrees toward unloading side.

32—Weighers and Fillers . . . For those interested in controlled packaging, an eight-page catalog is available from the Weigh Right Automatic Scale Co. It covers equipment to handle dry products in all types of containers from milligrams to 100 lbs. in semi-automatic and full automatic models for output speeds from 10 to 150 or more per minute. Included are descriptions of machines for coupon inserting, bucket elevating, conveyors, carton sealing, and fillers.

A LOAD OFF YOUR MIND!

Whether you need a pallet for lightweight loads, a standard pallet for general use or a special pallet for an unusual operation, you can RELY ON ACME ENGINEERS to recommend the most suitable, low cost . . .

Plants throughout the U. S. for
DELIVERY EVERYWHERE!
WRITE FOR QUOTATIONS

ACME PALLET CO., INC.
19 PARK ROW, NEW YORK 7, N.Y.
BEEKMAN 3-6646

OPPORTUNITIES

Men wanted Jobs wanted Lines available

Rates for "Positions Wanted" $4.00 minimum for 25 words, each additional word 10c; bold-minimum, limit 25 words. For all other face type or all capitals, $7.50 minimum for 25 words, each additional word 15c; limit 50 words. Box addresses count as five words. All insertions are payable in advance.

These classified columns are not intended for the advertising of new products by manufacturers, their representatives, or their distributors. These columns are limited to Help Wanted or Positions Wanted advertisements, and for the offering of used equipment by the users of such equipment.

USED EQUIPMENT WANTED

OPPORTUNITIES
USED EQUIPMENT WANTED

Want any quantity of new or used 2 and 4 wheel Rubber Tired Hand Trucks, Hand Operated Lift Trucks and Stackers. We buy Factory, Counting and Platform Scales in any condition.

Security Scale Works
718 W. Randolph St.
Chicago 6, Illinois

LINES WANTED

We would like to have additional lines of Material Handling Equipment for Western Penna, Eastern Ohio and Northern West Virginia. Display Room and warehouse on two major highways. H. L. Stitt Company, 1032 Penn Ave. Wilkinsburg, Pa.

FOR SALE

CAR SPOTTER SALE

5 New surplus electric 5 HP car puller hoists complete with Timken bearings, bronze worm gear, ball bearing motor, sturdy steel base, vertical capstan, etc. (5000-lb. starting pull)------$368 each
1 Same as above, except 10 HP model (10000-lb. starting pull). Handles up to six cars---.----------$537

AMERICAN WAREHOUSE
P. O. Box 1546 Pueblo, Colorado

Approximately 2,500 skid platforms, mostly Yale and Lewis Shepard—sizes 54 x 40 x 13. All hardwood and steel bound. Complete Cleveland Tramrail carrier system, including three three-truck carrier trains, motor generator set, fourteen switches, approximately 1,800 feet of track. Platform trucks for use with tramcars. Size 54 x 40 x 13, hardwood tops, angle iron bound with forty-inch high iron push rail. Roller bearing stationary wheels at one end and swivel ball bearing casters at the other. Box 10148, Flow.

2 Model POK-948 Barrett electric handlift trucks, 4000# capacity, platform 24" wide x 48" long, rubber-tired, in good condition, each equipped with battery and charger. Price complete—$800.00 each, or $1,500.00 for both. S. Riekes & Sons, 1402 Webster Street, Omaha 2, Nebraska.

POSITIONS WANTED

Man with 10 years' experience in the engineering, administrative and operational phases of Material Handling will be available October 15th. College education. Short or long term assignment acceptable. Box 9648, FLOW.

Correction. The prize-winning Cost Analysis Paper "Castered Trucks As Cost Reducers", page 44, September FLOW, mistakenly gave the "Buda" Co. as author Walter Ewend's affiliation. The correct name of the organization is The Budd Company, of Detroit.

SWIVEL CASTERS

- **Single Ball Race**
- **Molded-On Rubber Tires**

Heavy duty rubber tired wheel casters for jobs where floors suffer under heavy loads on metal wheels. Quiet, resilient, long lasting. The rubber will not separate from the metal. Hyatt type roller bearings. Wheel cores of heavy duty semi-steel. We serve resale dealers and original equipment manufacturers.

SPECIFICATIONS

Caster No.	Wheel Size	Bolt Hole Centers	Height	Capacity
44 SRC3	3x1⅜	2⅜x3 5/16	4¼	125 lbs.
44 SRC4	4x1½	2 11/16x3 11/16	5¼	140 lbs.
44 SRE4	4x2	3 3/16x4⅝	5¾	200 lbs.
44 SRE5	5x2	3 3/16x4⅝	6¾	250 lbs.
44 SRE6	6x2	4⅛x5½	7¾	310 lbs.

Buffalo CASTER & WHEEL CORP.
182-6 Breckenridge St., Buffalo, N. Y.

INDUSTRIAL TRUCKING FLOORS
Resurfaced to withstand any traffic . . .

with CAMP'S No. 7 INDUSTRIAL FLOOR RESURFACER

Tougher than Steel—Easy to Apply

COSTS ONLY $15.00 PER 100 SQUARE FEET

Camp's No. 7 is applied like cement over your present wood or concrete floors. A ¼ inch thickness resurfaces worn or rough concrete floors to withstand any traffic. Sets in three or four hours—ready for heavy trucking in 24 to 48 hours. Camp's No. 7 comes ready to mix—nothing else needed. Your choice of brown, red and natural dark gray.

Order a trial unit—you must agree it is the best resurfacer you have seen, or there will be no charge.

EVERY INSTALLATION UNCONDITIONALLY GUARANTEED

Further information describing this and other Camp's flooring material sent on request.

The CAMP COMPANY, INC.
6956 S. State St., Chicago 21, Ill., TRIANGLE 4-4770-1-2

One of 1458 LOAD-FLOATING WORK-SAVING Colson CASTERS

To meet every need exactly, there are 1458 different standard designs of Colson casters—many of them continuously stocked for immediate shipment. Long notable for quality that has made them the replacement choice of industry, they offer you big dividends in faster handling, easier work and reduced floor damage. It pays you to get the facts—write today for free 68 page catalog.

Model No. 3-527-65 swivel fork caster, ideal for use on medium weight industrial equipment. Double row of ball-bearings in hardened raceways; heavy oversize king bolt, patented lock nut. Built for years of rugged service.

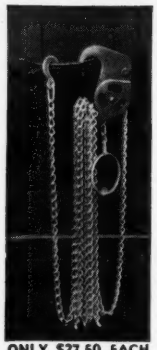
THE COLSON CORPORATION

ELYRIA, OHIO

CASTERS • • LIFT JACK SYSTEMS • • INDUSTRIAL TRUCKS

WORLD'S EASIEST WAY TO OPEN ANY BOX CAR DOOR

NOLAN ONE MAN CAR DOOR OPENER



ONLY $27.50 EACH
F. O. B. Bowerston

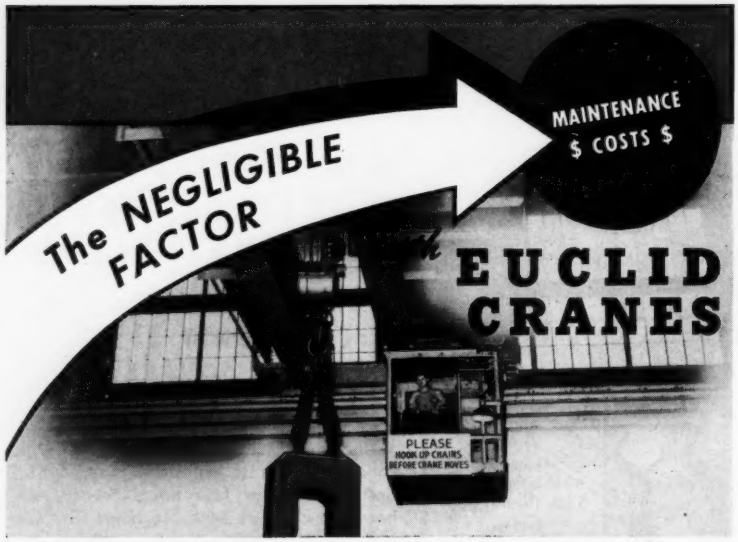
One man can open the most binding, balky box car door with the Nolan Car Door Opener. Get greater safety . . . speed loading and unloading schedules . . . order an ample supply to fill your needs today!

● No strained muscles. No slips or falls. No broken arms, legs or mashed fingers. No fatalities. No time wasted. No "gangs" needed. No time loss.

Write for free descriptive literature.

The Nolan Company

110 Pennsylvania Ave., Bowerston, Ohio



By reason of the highest grade materials and construction embodied in Euclid Cranes, they are guaranteed to perform and serve you for long periods with a minimum of maintenance expense.

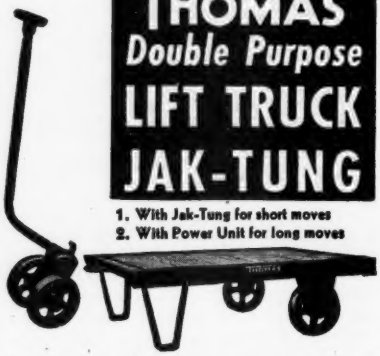
High grade, wide face, coarse pitch gearing — short, heavy shafts to withstand stress and anti-friction bearings throughout, aid strongly in supporting the Euclid guarantee.

EUCLID CRANES AND HOISTS Raise Profits

THE EUCLID CRANE & HOIST CO.

1362 CHARDON ROAD • EUCLID, OHIO

THOMAS Double Purpose LIFT TRUCK JAK-TUNG



1. With Jak-Tung for short moves
2. With Power Unit for long moves

This Thomas handling system combines power truck, hand lift truck and Jak-Tung operation. For long hauls use a power truck, for short movements and spotting of loads in crowded quarters use a Jak-Tung lift unit. This dual purpose Jak-Tung truck thereby gives more flexibility and efficiency than dead skids. Avoid waiting for power unit . . . reduces number of lift trucks needed . . . lifts from any angle. One of many Thomas Jak-Tung, 2 wheel and platform trucks. Write for catalog.

THOMAS TRUCK AND CASTER CO.

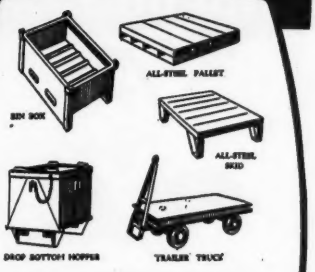
3174 Mississippi River Keokuk, Iowa

Representatives in principal cities

JOBBING FOUNDRY . . .
(Continued from page 45)

equipped with devices for moving material, supplies and equipment in its own operations. 2. Strategic location of handling equipment holds all moves at a minimum. 3. Overhead cranes and powered floor equipment are readily available for inter-departmental handling. 4. Production cycles keep molds moving toward the melting furnace department and shakeouts. This system provides for the shortest possible move of molten metal. Reusable materials such as sand, pallets and flasks are automatically returned to molders' stations. As completed castings travel from the pouring areas to the finishing departments they at the same time advance to the shipping dock. In this way, congestion or backtracking is eliminated, good housekeeping is promoted, traffic is reduced and materials are constantly available to operators.

Special Equipment
FOR THE EFFICIENCY OF YOUR
MATERIALS HANDLING



Designed and built to your specific needs, Fab-Weld **all-steel** equipment means top economy, strength and durability. Trucks, dump hoppers, skids, racks and bin boxes are examples of Fab-Weld geared-to-the-job engineering.

Write our Materials Handling Division for full details. Representatives in all principal cities.

FAB-WELD CORPORATION
RICHMOND STREET at PICKWICK
PHILADELPHIA 34, PA.

PALLETS

MADE TO YOUR SPECIFICATIONS!

From Air Dried Hardwoods

ALSO

BOX PALLETS
BULKHEADS
CRATES

Write and tell us your needs or send us your specifications for quotation.

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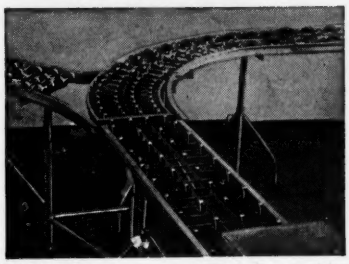
MILLS: Arkansas - Georgia - Wisconsin Minnesota

SPEEDWAYS GIVE YOU
More Time
FOR PRODUCTION AND SALES!



SPEEDWAYS save you time! You can save labor costs, too—by installing low-cost SPEEDWAYS GRAVITY CASE CONVEYORS . . . and you'll speed up production at the same time.

DOUBLE YOUR PRODUCTION WITH SPEEDWAYS "Y" FLIPSWITCH

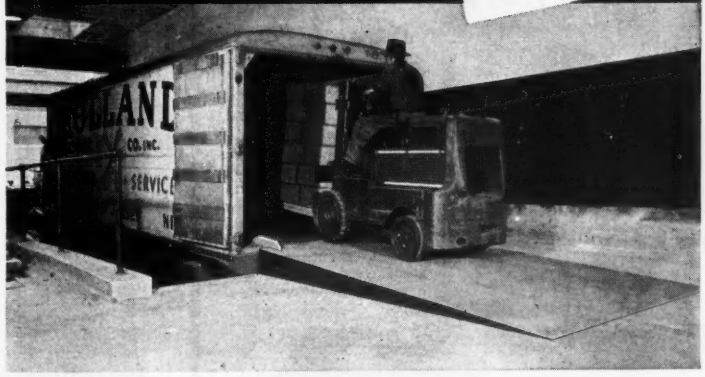
The "Y" Flipswitch illustrated permits a double flow of materials—in either direction—by simply manually flipping the switch. Used in conjunction with standard 5' or 10' lengths (12", 15" or 18" wide) of Speedways sections.

Write for Speedways FREE new illustrated folder—No. 147.

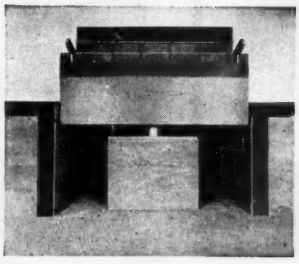
KEEP 'EM ROLLING WITH
SPEEDWAYS CONVEYORS, INC.
1242 Niagara St. Buffalo 13, N. Y.

Represented by experienced Material Handling Equipment Engineers in principal cities in U. S. and foreign countries.

IT'S THE NEW
LEVA·DOCK*
Adjustable Ramp For Loading Docks



New hydraulic device keeps dock lined up with truck bed level



The Leva-Dock moves up and down with varying truck bed levels—permits fork lift trucks or other vehicles carrying heavy loads to move directly into trucks or trailers. Users say there's nothing like it. Backed by Rotary's experience on 45,000 hydraulic lifts. Write for Catalog.

ROTARY LIFT CO.
1158 Kansas, Memphis 1, Tenn.
*Reg. U. S. Pat. Off.

You'll Save Time, Money, Man-Power With This *Easier-Handling, Longer-Wearing* "Weld-Bilt" HYDRAULIC LIFT TRUCK

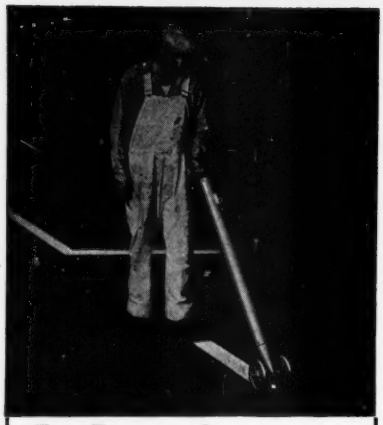
Truckers use the WELD-BILT Hydraulic Lift Truck with enthusiasm because it's easier to move, simple to operate with minimum effort. Yet it is *tough* and sturdy enough to take years of hard work and abuse.

Important to the WELD-BILT's longer service life is the HORIZONTAL MOUNTING of the Hydraulic Unit — locating this vital unit in a protected position away from any danger of daily knocks and bumps. And this unit is interchangeable; it can be replaced after years of service to add still longer utility to the truck.

Prove the benefits of WELD-BILT equipment in *your* materials handling. There's a size to fit your needs exactly. Write for bulletin 242.

"Weld-Bilt" PRODUCTS

WEST BEND EQUIPMENT CORP.
241 WATER STREET, WEST BEND, WISCONSIN
MATERIALS HANDLING ENGINEERS



For Ease and Economy of Use

The "MARK-RITE"

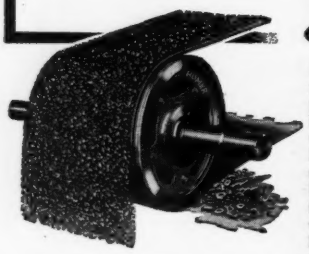
Let "Mark-Rite," the easy to operate portable paint marker, lead the way to increased efficiency and safety in and around your plant.

Check these important features: Aluminum construction ● Gravity feed ● No hose or electrical connections ● Self cleaning valves ● No straining of paint necessary ● Paints lines in 2", 3" or 4" widths ● Operates with unskilled labor ● Fully guaranteed.

Write for illustrated folder and prices

UNIVERSAL MFG. & SALES CO.
8716 So. Santa Fe Ave. South Gate, Calif.

Homer PERMANENT MAGNETIC, NON-ELECTRIC *Separators*



Homer permanent magnetic pulleys offer you the most in protection against tramp iron infiltration into finished products or expensive machinery. Employing powerful Alnico magnets, Homer Permanent Magnetic Pulleys range in size from 12" to 24" in dia., with widths to 60". Homers handle burden depths from 2½" to 5" depending on material.

Plate type magnetic separators, single or triple gap, standard or hinged mounting are available for all types of tramp metal separation. Standard widths range from 4" to 26". Special sizes available. Cast aluminum deck furnishes complete self-insulation. Cast aluminum cover shields powerful Alnico assembly against dust and moisture. No wires or electrical accessories necessary

PRODUCERS OF MAGNETIC SEPARATOR EQUIPMENT SINCE 1923

The HOMER Manufacturing Co., Inc.
LIMA · · · OHIO
PERMANENT MAGNETIC SEPARATORS — PLATE TYPES AND PULLEYS

are LARGE HEAVY CRATES *Your problem?*

LOW COST
ROL-A-LIFTS
HANDLE THEM EASILY

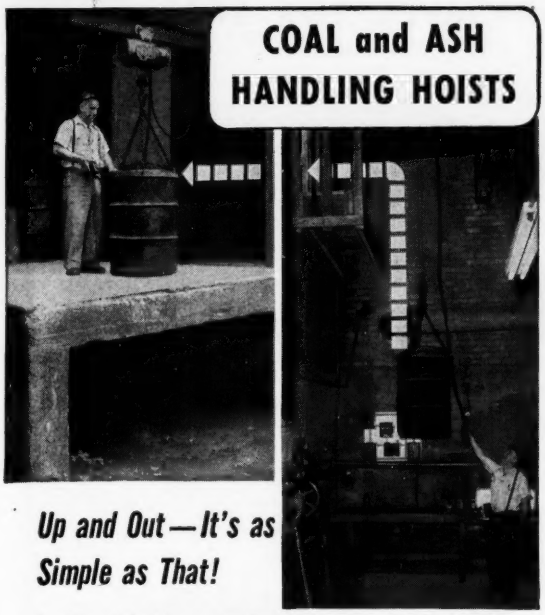
Hundreds of firms—railroads, truckers, stores, warehouses use Rol-A-Lifts for fast, easy handling of heavy, bulky crates (10 to 20 ft. long or longer), bundled steel, skid-mounted or palleted material. Built-in hydraulic jack lifts load. Full-swiveling casters. Load can be rolled into freight cars and tight spots. Four models: 2, 4, 6 and 8000 lb. capacities. Order in sets of two—one Rol-A-Lift for each end of the load.

SKARNES ENGINEERING & SUPPLY CO.
2428 Riverside Ave., Minneapolis, Minn.

WRITE FOR FOLDER AND PRICES

ROL-A-LIFT

COAL and ASH HANDLING HOISTS



Up and Out—It's as Simple as That!

Loaded ash bucket starting from boiler room floor, is hoisted to overhead platform. Hoist on monorail beam carries bucket from platform to dock. Push Button control provides operation at boiler room floor or dock.

Detroit Hoists save time, eliminate hard labor, keep heating plants clean. Write for Bulletin 805.

DETROIT HOIST & MACHINE CO.
8216 MORROW STREET • DETROIT 11, MICHIGAN

NOW! Safety and Parking Lines at Walking Speed!

THE "FLORLINE" MARKING MACHINE

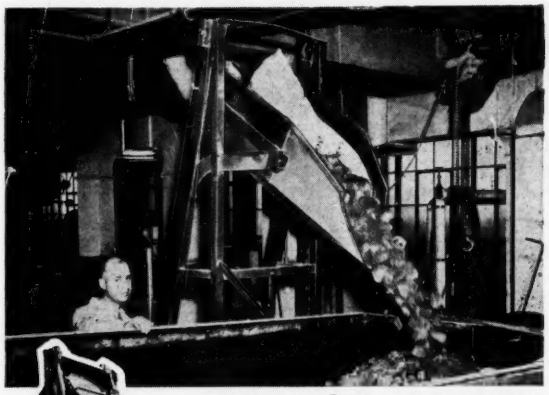
Operates on Gravity Feed! Without Compressed Air or Electrical Attachments

$89.50
F.O.B. DETROIT

Factory and town maintenance men, auto dealers, service garages and parking lot operators endorse the "FLORLINE". Here is a one-man one-hand operation with nothing to go wrong! "FLORLINE" is easy to use . . . easy to clean. It's lightweight . . . sturdy . . . compact . . . simple to store . . . pays for itself quickly! Makes curved or straight lines continuous or skip, 2, 3 or 4 inches wide. Operates efficiently in narrow aisles. Holds 1½ gals. paint, lacquer or white-wash. Interchangeable carriages available.

Dealerships Available Some Areas

H. C. SWEET COMPANY
12083 Woodbine Avenue, Dept. F Detroit 28, Michigan



SAVES 1/3 MAN HOURS

IT's estimated by S. C. Johnson & Son Inc. that the Cesco Dumper saves ⅓ of their man hours in addition to eliminating back-breaking labor and personal liability.

The Cesco Dumper lifts and dumps any free flowing material up to 500 lbs. at the touch of a control button. Built for various heights with skips for any use—barrel, truck, open, dust-proof, bag.

Write for folder.

IT LIFTS · IT DUMPS
CESCO DUMPER

COLSON EQUIPMENT & SUPPLY CO.
1321 WILLOW STREET LOS ANGELES 13, CALIFORNIA

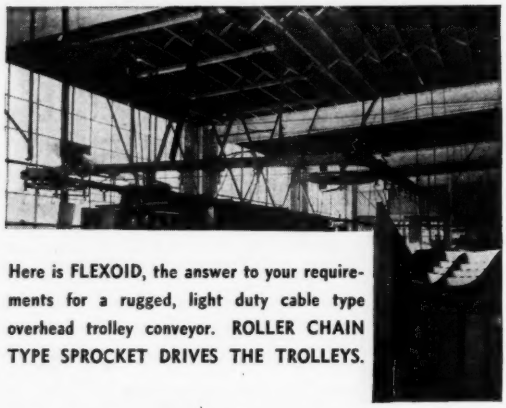
Metal Conveyor Belts... Custom-Made by *Cyclone!*

DON'T worry about choosing the right Conveyor Belt. That's what Cyclone engineers are for. Using one of three basic styles—Chain Link, Flat Wire or Flex-Grid — they design a Cyclone Metal Belt that gives the best, the longest, the most economical service possible under *your* operating conditions. Cyclone plants are on both the East and West coasts—sales offices are in principal cities.

Write for *FREE* catalog No. 4

CYCLONE FENCE DIVISION
(American Steel & Wire Company)
DEPT. A-108, WAUKEGAN, ILLINOIS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS **UNITED STATES STEEL**



Here is FLEXOID, the answer to your requirements for a rugged, light duty cable type overhead trolley conveyor. ROLLER CHAIN TYPE SPROCKET DRIVES THE TROLLEYS.

Pitch of drive sprocket enables spacing of trolleys in any multiple of 1¼".

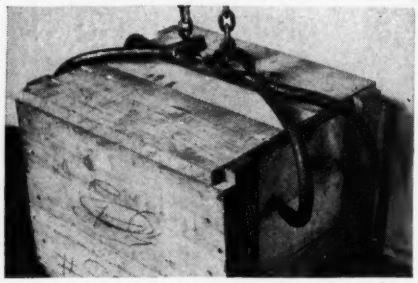
This multi-purpose conveyor is easy to install with no cutting or welding necessary on the job. Standard or special radii to meet any requirements for flexible trolley conveyors. Only a few minutes required to add or remove trolleys, if necessary.

FLEXOID overhead trolley conveyor is designed to give you years of practical service. Write us for further details.

SMITH POWER TRANSMISSION CO.
1542 E. 23rd Street, Cleveland 14, Ohio

MANSAVER BOX GRAB

ADJUSTABLE

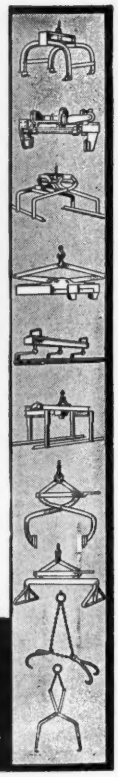


1054

A FEW PRICES BELOW

Size	500 lbs.	1000 lbs.	2000 lbs.
24"	$23.90	$28.00	$33.70
36"	26.30	31.80	36.50
48"	28.80	33.70	39.90
60"	31.80	38.60	42.80

Larger sizes easily adjusted for small boxes. Other Grabs for heavier sizes or narrower aisles and other objects. Write for Bulletin 631.



COMPLETE YOUR CRANES WITH
MANSAVER GRABS

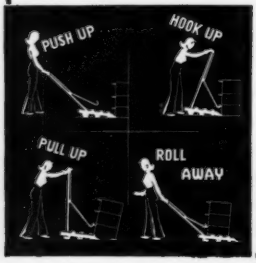
MANSAVER INDUSTRIES, INC.
3103 East St., New Haven, Conn.

IN THIS CORNER . . .

"George"

THE TOTE BOXING CHAMP . . . *who can take it and come back for more.*

Prevents strain and injury in lifting, hauling tote boxes. Back up truck to boxes, insert hook (actuated by handle-bar) into box handle (or hole). Pull truck handle forward. Leverage glides load over bevelled edge onto upper rollers. Lower rollers carry load to destination . . . easily, safely, little effort. Neat, powerful, long life. Get a dozen. Bulletin F.



ROLOCK INCORPORATED
FAIRFIELD, CONNECTICUT

11RG48

MATERIALS HANDLING

"On the beam"

This well-known radio manufacturer maintains a smooth, efficient flow of materials from receiving right down to shipping. Lewis Stacking Boxes with partially cut-out stacking runners provide easy pick-up and smooth handling.

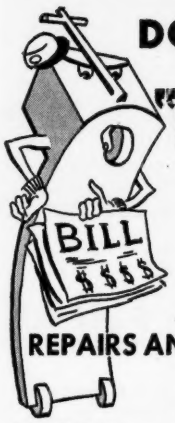
Take a tip from this manufacturer — be "on the beam" with better handling. Remember, efficient materials handling lowers production costs—increases plant efficiency. Send for details.

G. B. LEWIS COMPANY, 610 Mont. St., Watertown, Wis.
(Container Division)

SKID BOXES
STACKING BOXES
SHIPPING BOXES
BOX TRUCKS

LEWIS
INDUSTRIAL CONTAINERS

Also Mfrs. of Airplane Propellers, Bee Ware, Venetian Blind Slats and Golf Ball Washers



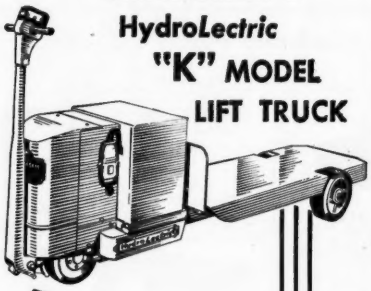
DON'T BE "DUNNED" BY A TRUCK!

REPAIRS AND DOWNTIME ARE COSTLY

Are "hidden costs" of parts, labor and downtime turning your truck's purchase price into just a first installment on continuing bills? Don't keep paying and paying! Lift Trucks, engineered and guaranteed by the creators of the lift truck system have proved time and again on the job to be the *lowest costing trucks.* Case histories of long, trouble-free service in famous plants throughout the land show that Stuebing designed Lift Trucks stay on the job . . . keep repairs and costly downtime to an amazing low.

Write for Bulletin L

HydroLectric "K" MODEL LIFT TRUCK



HAND LIFT TRUCKS

THE TOW TRACTOR

Engineered and Patented by W. Stuebing

LIFT TRUCKS INC. WWW.STUEBING CINCINNATI

LIFT TRUCKS INCORPORATED

2425 Spring Grove Ave., Cincinnati 14, Ohio

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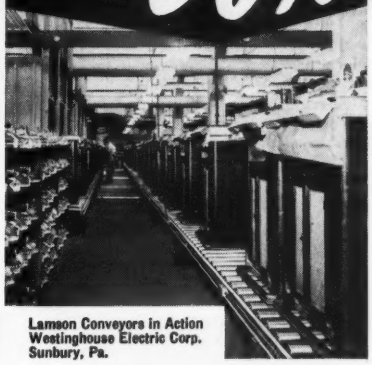
CUT YOUR COSTS up to 30%



Lamson Conveyors in Action
Westinghouse Electric Corp.
Sunbury, Pa.

LAMSON CONVEYORS

SAVE wasted effort . . . handling time . . . and floor space.

SPEED flow of materials for greater production.

- It's a fact. Materials-handling costs actually eat up to 30% of your manufacturing dollar. *And — there's nothing to show for it in your finished product.*
- That — for management — is a tough headache.
- *But this is also an incontrovertible fact.* Lamson Conveyors have drastically cut materials-handling costs in thousands of plants. (The Westinghouse Plant above is only one.) They can do the same for you.

For Greater Savings— LAMSON Pneumatic Tubes

- Coordinate flow of papers with the flow of materials on Lamson Conveyors. Save costly messenger service . . . speed flow of mail, telegrams, requisitions, small tools, samples, and blueprints.

In One Plant Alone LAMSON TUBES Saved $150,000 in one year

MAIL THIS COUPON TODAY!

FREE BOOKLET

LAMSON CORPORATION
1300 Lamson Street, Syracuse, New York
Please send me further free information on:

☐ Conveyors ☐ Pneumatic Tubes

Company .....

Address .....

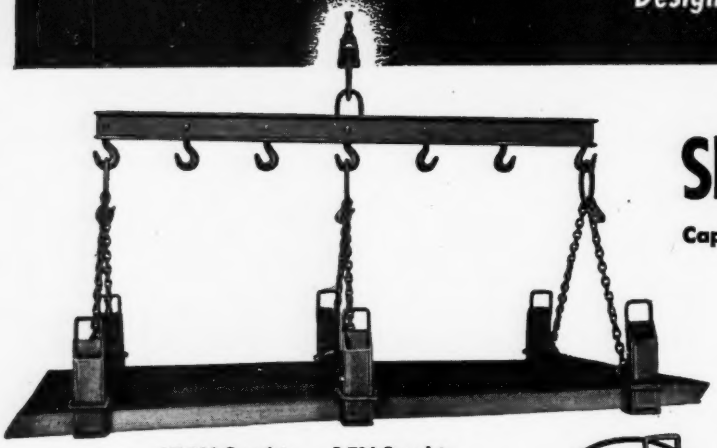
City ..... Zone... State.....

My Name .....

PALMER-SHILE

MATERIALS HANDLING EQUIPMENT

Designed to do Specific Jobs Better



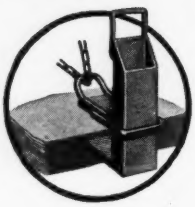
NS-364 Complete
(3 ton capacity)
$150.00

B-704 Complete
(5 ton capacity)
$225.00

SHEET STEEL GRAB

Capacity 1, 2 and 3 tons (1 ton per sling)

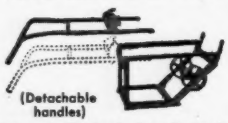
Adaptable to any size lift of sheets within 0″ to 9″ in thickness, 18″ to 48″ in width, any length. For short bundles use one grab without beam, for average bundle use two grabs—for long, flexible bundles use three grabs. As illustrated, handles three tons. Holds without slippage, distortion or damage to stock. Adjustable for low head room. Supporting beam 6 feet long—carefully engineered and heavily constructed for extra safety and service.



We Design and Build all types of pick-up, loading, moving, shipping, dumping and storage materials handling equipment.

NS-506DH
(Detachable handles)
$44.50

Combination Truck and Drain Rack



(Detachable handles)

Automatically loads barrels up to 1,000 lbs. with ease. Heavy all welded angle iron frame, tubular handles, free rolling wheels. Detachable handles for storage.

Trunnion Box Truck

Speeds handling. Of heavy bar stock, well reinforced, tubular handles, welded construction. Two 10″ roller bearing metal wheels.

B-268 $45.00

B-290 T Box $18.65

12 gauge steel plate square trunnion box—18″ x 18″ x 24″. (Minimum lots of 10.) Wt. 80 lbs.

Industrial Dust Pan

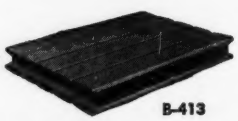
S-703
$19.50

Sturdy, light to handle. Basket 16 gauge sheet steel 18″ x 18″ x 18″—frame all welded construction—8″ rubber, ball bearing wheels. Wt. 45 lbs.—capacity 1 bushel.

B-205 $15.00

Drum and Barrel Sling

Handles barrels, drums, kegs—anything with a lip. Half ton capacity. Heavy welded chain and forged grab hooks. Wt. 8½ lbs.



B-413

Double Face All Metal Pallet

Built for extra heavy duty—two way—for power fork truck only. Special rolled steel, corrugated. (Other sizes, types to order.)

Two Wheel Hand Truck

With safety knuckle guards—straight back for handling boxes, crates, bags, etc. Heavy 7″ nose plate. Reinforced welded angle iron frame.

B-439ML $24.50
20″ wide, 48″ high, metal wheels

B-439MS $20.00
18″ wide, 42″ high, metal wheels

B-439RL $28.25
20″ wide, 48″ high, rubber tired wheels

B-439RS $25.00
18″ wide, 42″ high, rubber tired wheels

NS-21M
(Metal Wheels)
$38.50

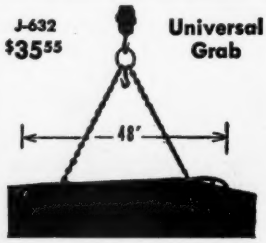
NS-21R
(Rubber Tired Wheels)
$46.45

Turn Table Tilt Truck

All purpose use in warehouse or factory—turns in own radius. Platform 1¼″ hardwood 48″ x 28″—reinforced. Roller bearing wheels — two swivel type. Wt. 75 lbs.

J-632 $35.55

Universal Grab



Hook type, picks up heavy boxes, crates, bales, from 16″ to 48″ across. Heavy forged steel hooks with adjustable spread. Capacity 2,000 lbs.

When Ordering give item number to prevent error. All weights approximate, all prices f.o.b. Detroit, Mich. Prices subject to change without notice.

DESIGNED AND MANUFACTURED BY

Palmer-Shile Co.

16012 Fullerton Ave., DETROIT 27, MICH.

In this camera study, a light bulb on the worker's wrist produces this tangled mass of lines, showing his movements. If your truckers make such moves repeatedly—you are wasting time and money.

Wow! what a tangle!

...but so easily unsnarled...with a BARRETT

Avoid these costly tangles! Straighten out your handling problems with Barrett Lift-trucks and Skids.

They put an end to repeated loading and unloading—piling and unpiling. The loads stay on the skids . . . always ready to roll with the sweep of the Lift-truck handle.

There are no waste moves as Barrett Lift-trucks and Skids take your materials from room to room, floor to floor, in and out of storage . . . so quickly and easily that one man with a Barrett actually handles more than 3 or 4!

Ask to see the Barrett system. A Barrett engineer will be glad to demonstrate.

Send for your free *copy of the Barrett Junior Catalog.*

BARRETT-CRAVENS COMPANY

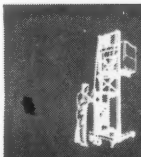
4619 South Western Blvd. • Chicago 9, Illinois

Representatives in All Principal Cities

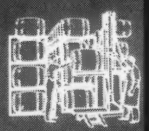
Canadian Licensee: S. A. Armstrong, Ltd., Toronto, Canada

BARRETT

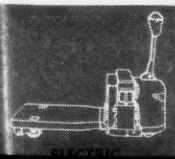
ONE MAN DOES MORE THAN 3 OR 4 . . . WITH A BARRETT



PORTABLE ELEVATORS

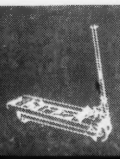


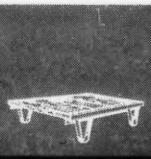
STEEL STORAGE RACK



ELECTRIC

Barrett Handling Equipment





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Distributors Are Circulation Managers

Each of FLOW'S 46 material handling equipment distributors subscribes to the magazine for his active customers and prospects. He pays us $1.20 a year for each subscription. This guarantees that each FLOW reader is interested in the editorial contents of the magazine, and—equally important—is an active, authenticated buyer of material handling equipment . . . the distributors being the authenticating agent.

FLOW means business. Its more than 29,000 readers are YOUR potential buyers because they are also active, current customers of leading material handling distributors. Here is circulation representing the known national market for material handling equipment . . . a buying audience to whom you must tell your story.

"Certified Buying Power" is a powerful lever which you can use to raise your sales volume.

Other "C. B. P." magazines published by the Industrial Publishing Company are REFRIGERATION INDUSTRY, for the refrigeration and air conditioning field, INDUSTRY and WELDING, for the welding supply and equipment field, OCCUPATIONAL HAZARDS, for the industrial safety, health and fire protection field, and APPLIED HYDRAULICS for the hydraulic field. Send for our booklet: "The 'C. B. P.' Plan . . . A New Dimension Added to Standard Magazine Audits."

Flow MAGAZINE

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